INTERNATIONAL PROJECTIONIST

JANUARY 1954

VOLUME 29 • NUMBER 1

30c A COPY • $2.50 A YEAR

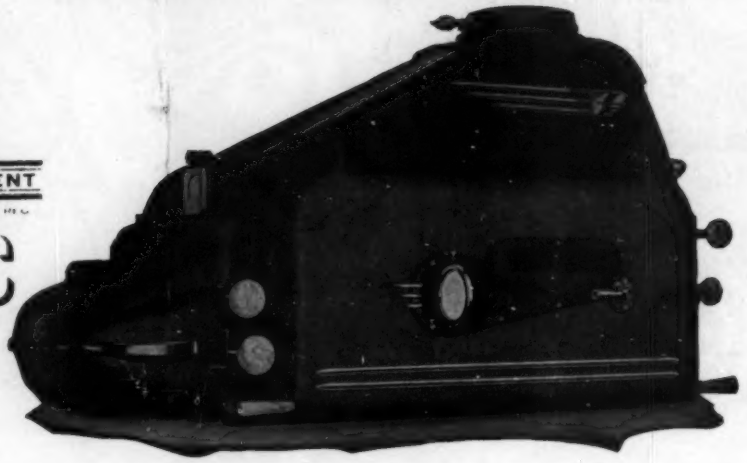
NOW
IN AND RUNNING
CINERAMA

AT

NEW YORK **CHICAGO** **LOS ANGELES**
PHILADELPHIA **BOSTON** **WASHINGTON, D. C.**

Peerless HY. CANDESCENT

CINEARC



TRUTH IN ADVERTISING

No lamp in the World!

CAN PRODUCE AS MUCH LIGHT
For
CINEMASCOPE

Buying less to save money is like stopping the clock to save time

J.E. McAULEY MFG. CO.
552-554 WEST ADAMS STREET
CHICAGO 6, ILLINOIS

ANOTHER PRACTICAL ANSWER... *from* RCA

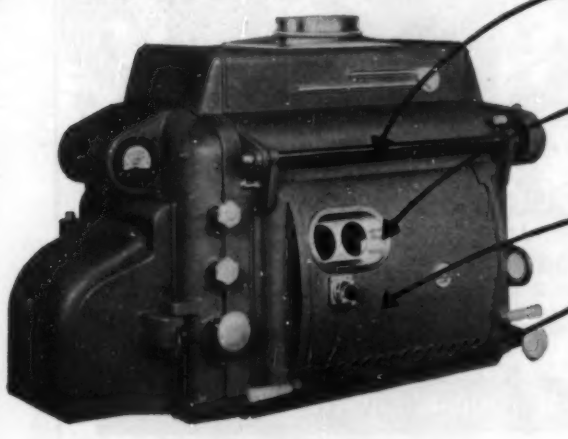
NEW BEAM POWER

pours more light on any screen . . .

NOW, HERE'S THE EXTRA LIGHT POWER the new motion pictures call for . . . the new RCA Wide-Arc Lamp System.

This is the lamp that brings 3-D and large-screen presentations to life—pours light on the screen where even your present high-amperage lamps fail to measure up.

RCA's new Wide-Arc Lamp System features a revolutionary "Hi-Efficiency" design . . . For rapid dissipation of excess heat . . . For extra protection to the lamp's high speed reflector . . . And for the prevention of film damage . . . The result—More light per ampere, than any other projection lamp ever before offered!



New Operating Economy. The carbon burning rate is low—Operating costs are kept to a minimum.

New Automatic Water Circulator. Keeps operating temperatures down. Starts automatically for extra protection.

New High Speed Positive Carbon Rotation. 15 complete revolutions per minute—Provides maximum arc stability. Carbon rotating chain drive, requiring no lubrication, eliminates troublesome gearing.

New Large High Speed Reflector. Co-ordinates closely with modern high speed projection lamps—better light distribution than ever before.

New "Instant-Acting" Ventilating Assembly. Large screened vents in lamp house base suck in cool air which instantly forces heat, carbon dust and ash out through a downward extending tube—keeps reflector cool and free of carbon dust for maximum efficiency.

Equally Efficient with Standard and new Hitex Carbon. Superior screen illumination with either standard high-intensity carbons or the new Hitex carbons.

It's RCA's answer to today's big light problems. Demonstrations on screens up to 70 feet wide prove it's everything you could ask for in big light power. For more light in drive-ins, for more light in 3-D and large-screen presentations, pour it on with the new RCA Wide-Arc Lamp System.

CHECK with your RCA Dealer for information on the Wide-Arc Lamp.

THEATRE EQUIPMENT

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

SEEING IS BELIEVING!

FAMOUS "FIRSTS"...

50 YEARS AGO, "THE GREAT TRAIN ROBBERY" ATTEMPTED THE FIRST COMPLETE, DRAMATIC FILM STORY. TO THE ENTERTAINMENT WORLD, A FLEDGLING GIANT WAS BORN.

MOVIELAND'S INFANT PRODIGY FOUND GROWTH AND VERSATILITY IN DEVELOPMENT OF INDOOR AND AFTER-DARK LIGHTING TECHNIQUES... USING "NATIONAL" CARBON ARCS...

TODAY...STILL FIRST WITH THE RIGHT LIGHT FOR EVERY JOB, "NATIONAL" PROJECTOR CARBONS ANSWER THE CHALLENGE OF EXCITING, NEW AUDIENCE-BUILDING TECHNIQUES.

THE "NATIONAL" CARBON ARC...NOTHING BRIGHTER UNDER THE SUN

The terms "National" and "Suprex" are trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street, New York 17, New York

District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

INTERNATIONAL PROJECTIONIST

With Which Is Combined PROJECTION ENGINEERING

FREDERICK HODGSON, *Editor*

JAMES MORRIS, *Associate Editor*

Volume 29 **JANUARY 1954** **Number 1**

Index and Monthly Chat.... 5

1954 Seen As Biggest Year for Color..... 7
JAMES MORRIS

Recent Projection Advances In Europe, II..... 9
ROBERT A. MITCHELL

Color Catalyst in Battle of the Tubes..... 14
FREDERICK HODGSON

The 3-D Score for '54..... 16
THOMAS L. BURNSIDE

What's Your Problem?..... 17

Personal Notes..... 17

In The Spotlight..... 20

Turn Your Projection Skills Into Cash..... 21
MICHAEL SMOLLIN

Free Polaroid Land Cameras. 23

More Small Theatres Go Stereophonic 24

IA Obituaries..... 25

Index: International Projectionist January to December, 1953..... 33

News Notes

Technical Hints

Miscellaneous Items

Published Monthly by

INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

19 West 44th Street, New York 36, N. Y.

Telephone: MUrray Hill 2-2948

R. A. ENTRACHT, *Publisher*

SUBSCRIPTION REPRESENTATIVES

AUSTRALIA: McGills, 183 Elizabeth St., Melbourne

NEW ZEALAND: Te Aro Book Depot, Ltd., 64 Courtenay Place, Wellington

ENGLAND and ELSEWHERE: Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2

YEARLY SUBSCRIPTION: United States and possessions, $2.50 (two years, $4); Canada and foreign countries, $3; single copies, 30 cents. Changes of address should be submitted two weeks in advance of publication date to insure receipt of current issue. Entered as second class matter February 8, 1932, at the Post Office at New York, N. Y., with additional entry at Yonkers, N. Y., under the act of March 3, 1879.

Entire contents copyrighted 1954 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited communications.

MONTHLY CHAT

AS 1954 opens the film trend is still towards the wide aspect ratio, stereophonic sound, more 3-D, and the ultra-skilled tub-thumping of 20th Century-Fox. One producer after another is jumping on the bandwagon, each whipping the horses in his own way.

International Projectionist, surveying the scene with what we fondly hope is editorial detachment, holds with Shakespeare that "the play's the thing" and that no amount of gadgetry can substitute for good pictures. Technological progress is inevitible, desirable and healthy but it must not be allowed to become an end in itself.

Illustrating the point in Columbia's "From Here to Eternity."

Here we have a picture, shot in standard black-and-white, that has been cracking boxoffice records all over the world. Why? The film does not have the advantage of Cinerama or CinemaScope novelty. Nor does it have the curious fascination of 3-D. Yet "Eternity" stayed at the 4,000-seat Capitol Theatre in New York for more than 20 weeks and grossed over $1,450,000. It broke all-time records in Tokyo, Japan, in Sydney, Australia, and in dozens of other cities abroad. It's well on its way to doing the same thing at the Marble Arch Theatre in London. At this writing the picture is playing a phenomenal 18th week in Washington, D. C. Even at the Shore Theatre, a Skouras house in Huntington, L. I., "Eternity" grossed $30,500 in one week.

What's the answer? Simply this:

A good picture will bring in the business — with or without 3-D, trick lenses or color!

"From Here to Eternity" is good enough to have won the top award of the New York film critics. It has been on every "ten best" list so far compiled, never below third place. And, according to those in the know, "Eternity" stands a better than even chance of winning the Academy "Oscar" in March.

True, Columbia did make an unfortunate bow towards the new processes by filing the aperture and showing "Eternity" at the Capitol in a ratio of 1.85 to 1, plus stereophonic sound. Most spots, however, are playing the picture straight.

Maybe, just maybe, the lesson of "Eternity" will be learned by the industry. Maybe, just maybe, 1954 will see the "sin" taken from CinemaScope and a move towards a safe and sane aspect ratio. Some projectionists, we're told, are filing apertures for greater picture height, rather than for width. Maybe, just maybe, this indicates that the trend has started. IP hopes so sincerely.

YOU CAN'T ARGUE WITH A LIGHT METER!

Burning the new 10 mm "Hitex" carbons at 135 amperes, or 11 mm regular carbons at 120 amperes, the new

Strong "SUPER 135" PROJECTION ARC LAMP

Projects a Much Higher Level of Illumination Than Any Other Lamp

In impartial tests the foot candle meter proves that it is the most powerful of all lamps, and you can't argue with a light meter.

Accommodating a 20-inch carbon, the "Super 135" is the only Reflector Arc Lamp which can burn the 10 mm "Hitex" carbon at 120 amperes or 11 mm regular carbons at 115 amperes for a full hour as required by 3-D 5000-foot reels. The increased volume of light projected by the "Super 135" is especially important with 3-D because of the 60% light lost to the viewer, resulting from the use of polaroid filters. The "Super 135" furthermore maintains a screen light that, in itensity and color value, is constant and identical to that of the associated lamp which is burning simultaneously.

The New INFRA-BAN BEAM-COOLER UNIT

positioned in the path of the light beam permits the free passage of the visible light rays while diverting the heat rays away from the aperture and back into the lamphouse from which heat is rapidly withdrawn by a mechanically induced air flow out through the stack. Thus, Strong has made possible a tremendous increase in usable light without a corresponding increase in heat at the aperture.

The position of the positive arc crater at the exact focal point of the reflector is automatically maintained, without manual adjustment by means of Strong's exclusive Lightronic crater-positioning system. Each carbon is advanced by a separate motor, the speed of which is governed by the Bi-Metal Lightronic Tube. A stream of air directed just above the arc stabilizes its burning and prevents the deposit of soot on the reflector.

Unit construction, whereby the various components are instantly removable, permits ready adaptation to any future developments in carbons or burning techniques.

Accepted for listing by Underwriters' Laboratories for intermittent service at 135 amperes and continuous service at 130 amperes.

For further information on projection arc lighting of 3-D or wide-screen pictures by any system, address Department 3-D

THE STRONG ELECTRIC CORPORATION
The World's Largest Manufacturer of Projection Arc Lamps
31 City Park Avenue Toledo 2, Ohio

Please send details on Strong "Super 135" Projection Arc Lamps.

NAME _____
THEATRE _____
STREET _____
CITY & STATE _____
NAME OF SUPPLIER _____

VOLUME XXIX JANUARY 1954 NUMBER 1

1954 Seen as Biggest Year for Color

Wide screen and 3-D systems need color to eliminate graininess and enhance entertainment values. This article covers the Eastman and Technicolor processes and discusses some projection and theatre lighting problems.

By JAMES MORRIS

DURING the year just past an important change has been taking place in the art of motion picture production, a change which has not received sufficient attention even from craftsmen within the industry because 3-D and CinemaScope have monopolized the limelight.

Partly because the new processes require color to maintain their effects of depth and realism, and also because Hollywood is generally making greater use of its technical resources in order to lure lost customers back into the theatre, about 75 percent of all films now planned or in production at the major studios are in color. This, of course, is exclusive of black-and-white films for television.

This estimate was made by Nick Tronolone, formerly president of Pathe Laboratories and now an independent consultant on motion pictures.

Color is Needed

"Use of color has been increasing at from 5 to 10 percent per year in the last five years with a big spurt during 1953," he said, "and its use will continue to grow."

An interesting point with regard to color and the new processes is the fact that the technical nature of wide-screen projection, whether it is accomplished by the CinemaScope system or merely by altering aperture plates and using a shorter focal-length lens, needs color to overcome the grainy effect resulting when 35-mm prints are blown up to giant screen sizes. This is in addition to the fact that color is needed for realism.

Situation Complicated

For the present at least, the color situation in Hollywood is complicated because the standard Technicolor "dye imbibition" method of printing cannot as yet be used to advantage on film photographed through a CinemaScope anamorphic lens.

This and other events of the past year have brought increasing popularity to the new Eastman Color which can be used as a complete camera and printing system, or in combination with Technicolor or other color processes. Ansco Color, a single-film, triple-emulsion color process, as is Eastman Color, has also been achieving wider usage.

Eastman Color has grown in popularity despite the fact that it is a more expensive process than Technicolor. At present it costs about $585 for a CinemaScope release print processed by Technicolor on Eastman Color film. Were Technicolor able to use its standard process on CinemaScope film, the cost would drop to $448 per print. However, the saving that Technicolor makes possible is true principally of heavy volume print orders.

Eastman Color is the process used in filming such CinemaScope productions as "The Robe," "How to Marry a Millionaire," "Beneath the Twelve Mile Reef," "Knights of the Round Table," and other pictures. Because of the increasing importance of color, projectionists may be interested in a general description of the Technicolor and Eastman Color processes and how they function.

Projection Problems

But, since the projectionist works in a theatre, he is primarily concerned with the technical problems of putting on a good show with the product received from Hollywood. If color is to become all-important in the motion picture business, the first question to consider is what procedures should be followed in the theatre if the best color projection is to be achieved. Technicolor, which has had a great many years experience in the processing of color motion pictures, has dis-

tributed information to projectionists on the handling of color film, and the subject has been covered in IP over the years in articles by Robert A. Mitchell and others.

It should be remembered that good color values cannot be obtained on the screen when light is discolored or not uniform. In an arc lamp that gives no better than 60- to 80 percent side-to-center distribution, color values on the screen are damaged. Red changes to terra-cotta, blue to steel-gray, and orange to brown. It has been standard practice in the past to process Technicolor prints for projection with high-intensity arcs capable of delivering ten or more foot-lamberts at the screen. Information about new-process light standards is not yet available from Technicolor, but it is reasonable to believe it will be substantially the same. If the illumination at the side of the screen falls far below the specified level, good results will not be obtained. A foot-lambert is a unit of measurement for the actual brightness of a screen surface.

An interesting sidelight to consider at this point is the suggestion that lighter-density color prints be used to obtain more light for beam-splitter 3-D projection. This is a highly questionable practice because with subtractive color processes such as Technicolor and Eastman Color, the color quality is directly related to the transparency of the film in such a way that really good color is available only with prints of high density. This will be true so long as dyestuffs that change saturation and hue with varying density are used for subtractive color processes.

House Lighting

It is regarded as bad practice to use any but absolutely necessary colored house lighting near the screen during the showing of a color film. The removal of red or amber decorative lighting in the auditorium is suggested to the extent possible under local regulations.

Color flooding of titles of Technicolor productions, either by projecting the title on a colored curtain or by using colored foot and strip light is bad practice because Technicolor titles are designed with care. Color-flooding alters the colors recorded on the film — colors which not only make the titles pleasing to see, but which harmonize the titles with the dramatic mood of the picture to follow.

It is also suggested that the projection arcs be struck two minutes before the changeover so that the discoloration produced by a cold carbon trim is avoided, and the arc be allowed to reach normal burning temperature before the changeover is made. Focus should be checked at the beginning of each reel.

Although it is only now coming to dominate American film production, color on the screen is, of course, far from new. The first color movie that could be run on a standard 35-mm motion picture projector without any changes or attachments was also the first Technicolor picture, "The Gulf Between," produced in 1917. Even this color system had been preceded as far back as 1909 by color systems such as the British Kinemacolor.

Color Before 1910

It may interest projectionists to know that Nick Tronolone, mentioned earlier in this article, was connected with the American affiliate of Kinemacolor and projected the first Kinemacolor showing in the United States before 1910, sweating over a hand-cranked projector that had to run at 32 frames per second — double the "silent" speed — to make the process work.

Kinemacolor used a red-and-green color wheel mounted on the projector and synchronized with the projector movement so that alternating film-frames, which carried red and green color values in black-and-white, would be in front of the proper section of the wheel. The red and green combined on the screen to give an effect of full color.

Mr. Tronolone, who is celebrating his 50th year in motion pictures during 1954, has worked in all technical phases of the business, projection and photography as well as laboratory processing.

Technicolor Processes

Dr. Herbert T. Kalmus, inventor of Technicolor, soon abandoned his first process, which made use of successive red and green tinted frames, when he decided that it was too crude. After the first World War he began to experiment with a subtractive color method which is the forerunner of the modern Technicolor process.

Two important developments came at this point. First, a split-beam camera was developed which recorded red and green color values on two separate strips of film. Then a subtractive rather than an additive color process was used by Dr. Kalmus in preparing the prints. A picture in natural color was produced on the print as well as the screen. In the previous additive process, then outmoded, white for instance, was produced on the screen by a rapid succession of colors. Curiously, in the color television of 1954 white is produced by a mixture of complementary colors. In the subtractive process, white is *white* on the finished print. This was a real landmark, not only because it improved the quality of the color, but also because the subtractive process permitted much more light to reach the screen.

In the additive process, such as the first Technicolor, alternate frames were tinted, or dyed, all over their entire area with the appropriate color — red or green. But in the double-print subtractive process developed by Technicolor about 1920, the black and silver were bleached out chemically from the two-color separation prints which were then toned to the desired color with the white areas of each print remaining free from color.

Two-Color System

Used in a picture called "Toll of the Sea," made in 1921, the above process differed from modern Technicolor in two important respects. It was a two-color rather than a three-color system. And, although it was a substractive system, the red and green color values were each carried on a separate film, both cemented together for projection. These double prints often buckled badly during projection.

It was "imbibition" printing (imbibition is a formidable-looking word that merely means drinking in or imbibing), developed for motion picture film the next year, that really opened the way for modern Technicolor. Instead of being toned or tinted for projection, the two color prints were converted into "wash-off relief" matrices.

These relief matrices, on which the raised gelatine image could be felt with the fingernail if it were run across the matrix film, were hardened and used in the imbibition printing process which is really not photographic at all but which resembles a lithographic printing process. The matrix bearing the red image, for instance, received or "imbibed" crimson dye from rollers with only the raised gelatine image

(Continued on page 31)

This Is the Second of Two Articles Covering—

Recent Projection Advances in Europe

European Developments, from the CinemaScope anamorphic lens to single strip 3-D, are revolutionizing American films: Here Mr. Mitchell looks at projection overseas

By ROBERT A. MITCHELL

IN THE DECEMBER *International Projectionist* various European projectors were discussed, and some emphasis was placed on projection lenses. This article, which concludes the present series, reports on optical soundheads overseas with special reference to photocells, on European projection lamps and on mirror and condenser systems.

The Ernemann sound reproducer, similar to the Ernophon S reproducer which may be attached to the back of any regular European projection head (shown in Fig. 3), departs widely from conventional American design. Unlike the heavy and complicated sound-heads with which American projectionists are familiar, the Ernemann, Bauer, and Europa-Klangfilm sound reproducers have no sprockets, no gears, no pressure rollers on the sound drum, and no complex rotary stabilizer. Such a reproducer weighs only 15 or 16 pounds.

"Braked Retard"

The film passes from the lower loop to a large idler roller, against which it is pressed by a rubber roller. This is the "braked retard" which filters out all intermittent flutters from the film. The film then passes around one or two rollers which smooth its motion still further, acting also upon irregularities of motion which might originate in any part of the film-course from the lower loop to the holdback sprocket. The sound drum, instead of being a plain cylinder which allows the film to be displaced sufficiently for scanning of the track, is a flanged roller which supports both margins of the film. Since the axial portion of the roller between the flanges has a small diameter relative to the diameter of the flanges (56 mm., or 2.2 in.), the scanning beam is not obstructed, but passes over it to the photocell. The film is quite tight over the drum, and since the flanges edge-guide the film, the tensioned inner flange pressing the film toward the soundtrack edge, no pressure guide-rollers are needed.

To the axle of the sound drum is attached a very accurately machined cup-shaped flywheel weighing 6 kilograms (13 lbs.) supported by two ball bearings placed at equal distances from the center of gravity of the rotating mass to assure an even distribution of the load.

Starting Speed

From 5 to 6 seconds has hitherto been required to bring the film at the scanning point to a perfectly constant speed when starting a projector. This was due to slipping of the film on the rotary sound drum caused by inertia of the flywheel. In the Ernophon S reproducer, however, the two rollers immediately above the drum are pivoted in such a way that both can be displaced against the action of an adjustable spring. The spring gives a lighter restoring force at small deflections than at large ones. And in order to reduce the swing of the yielding compensating device to a minimum of time, it is damped by a pneumatic dashpot.

When starting the projector, the double-roller equalizer is under the strongest pressure and moves downward to press against the rotary sound drum. The already large initial wrap of film around the drum is then further increased temporarily, increasing the friction between the film and the drum. The film cannot slip, but forces the drum to pick-up speed very rapidly. But as soon as the pull of the film decreases, when full speed has been attained, the rollers are lifted away from the drum automatically.

This arrangement permits the film to attain constant speed within 1 or 2 seconds, no disturbances of pitch being noticable at changeovers.

A double-roller compensator is used below the drum to filter out residual fluctuations in film speed caused by the lower sprocket of the projector and the takeup assembly.

Tube Is Small

The scanning-beam optical tube, although small, is fully corrected and highly efficient. Each of its several lenses is hard coated. The light output is high despite a slit image only 18 microns (0.7 mil) in width. This image provides better high-frequency response with less distortion than the 1¼-mil slit images often used in other countries.

Because the film is edge-guided at the scanning point by the flanged drum, the film being gently pressed towards the soundtrack edge to prevent any sideways wandering of the soundtrack, the slit in the optical tube is adjustable for length at both ends for correct centering upon badly displaced tracks as well as upon those positioned normally on the film. The longest slit image is 2.22 mm. (87.4 mils), while the normal length is 2.13 mm. (84 mils).

The photoelectric cell used in the

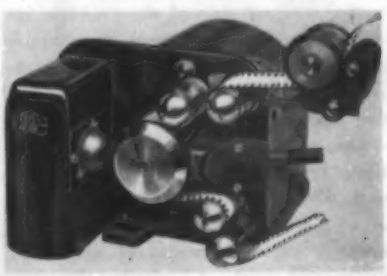


FIG. 3. The Ernophon S sound attachment for older European projectors. Similar to the sound take-off unit of the Ernemann IX and X projectors, this reproducer has no sprockets, gears, rotary stabilizers, or scanning-drum pressure rollers to mar its compact simplicity.

Ernemann and Ernophon S sound reproducers is an antimony-cesium blue-sensitive cell patented by Zeiss Ikon, but similar in response characteristics to the RCA photocell No. IP37.

Photocell Types

The regular-type photocell, having a cathode composed of a mixture of cesium and silver oxide coated upon a silver plate, is called a red-sensitive cell because it is most sensitive to red and infrared light, and responds only very feebly to blue rays. In fact, the sensitivity-peak of this cell, which is still the most widely used in all countries, lies in the invisible infrared region of the spectrum. Consequently, the red photocell works well only with silver-image tracks, not with colored-dye tracks which, if they could be used, would lower the cost of all types of multilayer, dye-coupler natural color prints. Silver images absorb red and infrared as well as all other wavelengths emitted by the exciting lamp, but dye tracks, no matter what color they may be, are quite transparent to low red and infrared radiation.

The blue cell is practically insensitive to red and infrared light, and thus gives excellent response with red (magenta plus yellow) soundtracks as well as with ordinary silver soundtracks. The Zeiss Ikon blue cell has, in addition to this property, superior electron-emitting characteristics and an exceptionally long life. There are, however, two disadvantages of the blue cell which will soon be mentioned.

Strontium Photocell

A strontium photocell having its sensitivity-peak in the green region of the spectrum is just now being developed in Germany. This green cell would work with magenta dye tracks, thus further simplifying the work of processing color prints.

Another solution of the problem involves producing a cyan dye which completely absorbs both red and infrared. While the common cyan dyes in use absorb "high" and "medium" red wavelengths very efficiently, most of them transmit bands in the low red and, what is more serious, practically all of the infrared emitted by an incandescent exciting lamp. If a perfect cyan dye could be produced, cyan tracks would give good response with the regular red-sensitive photocell.

It all amounts to making the soundtrack images "look" as dense as possible to the light-sensitive cathode of the photocell. To an ordinary red cell a dye track looks almost blank because the colored dyes, even when superimposed (cyan, magenta, and yellow) to look black to the eye, pass along waves which such a photocell readily perceives.

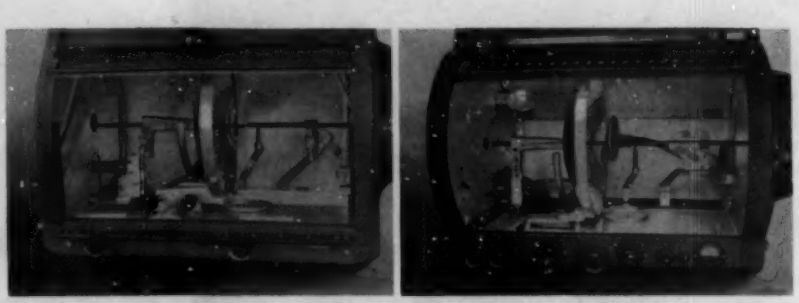


FIG 4. The Ikosol II (left) and Magnasol IV (right) convertible arc-lamps for both LI and HI operation at maximum optical efficiency. Note the clean design and centralization of controls.

To return to the blue photocell, we must point out that this type of cell, though very sensitive, is excited only by a very small portion of the rays emitted by the filament of an exciting lamp. Incandescent lamps give out mostly infrared, red, orange, and yellow rays, a fairly large amount of green rays, but relatively few blue and violet rays. And it happens that the intensity of the blue-violet radiation of an incandescent bulb varies much more than that of the red and infrared with fluctuations in the current which lights the lamp. This fact is revealed by a reddening of the light when the voltage is decreased.

Blue PC Faults

The sound-current output of a blue photocell excited by an incandescent lamp is therefore at the mercy of exciter-voltage fluctuations too small to affect the performance of a red cell noticeably. In theatres where line voltage is none too steady, the blue cell would behave very badly indeed and force the projectionist to stick by the volume control in an effort to maintain a constant level of volume.

Then too, we must take into consideration that the greater number of color prints in America are made by the dye-imbibition process (Technicolor), a method which is much less expensive than the use of multilayer dye-coupler color films. But imbibition printing, generally satisfactory for pictures, cannot be used for printing soundtracks because it involves a rather serious loss of image definition.

Satisfactory "resolution" is a necessity in soundtrack printing — a "fuzzy" track gives fuzzy sound, and no amount of electrical high-frequency equalization in re-recording can compensate frequencies which fail to print through in the projection copy. For this reason Technicolor films will always have to be made with silver soundtracks.

Small Preamplifier

The sound unit of the Ernemann X and IX projectors has a small preamplifier (visible in Fig. 2. *See December IP*) close to the photocell. This single-stage voltage-gain amplifier makes it possible to set up the main amplifier in any part of the projection room without danger of picking up noise or of attenuating the high frequencies. A preamplifier attached to the projector, it will be recalled, was employed in the very first Western Electric(ERPI) equipments; and most American manufacturers of soundheads now favor photocell coupling amplifiers.

Zeiss Ikon, the manufacturer of Ernemann projectors and sound reproducers, also makes "Dominar" theatre amplifiers, "Ikovox" speaker combinations, a separate cell-coupling preamplifier for use with earlier Ernemann models, or when the Ernophon S reproducer is used with other (European) makes of projector. Ernemann exciter rectifiers are part of the projector equipment, and in the Model X the rectifier is located in a metal drawer under the lamp table.

Dominar Amplifiers

The Dominar amplifiers require no detailed description, since their characteristics are very similar to the highest grade theatre amplifiers made in England and America. They have less than 2 per cent distortion, utilize degenerative feedback, and have frequency-response networks for adjusting to auditorium conditions. Noteworthy, however, are the very heavy

The Mark of Priceless Perfection

IN SIGHT AND SOUND EQUIPMENT

MOTIOGRAPH

theatre equipment designed for those who are satisfied only with the best . . . modern equipment that assures long, dependable, trouble-free service . . . yet seldom costs more than the ordinary. There's a Motiograph dealer near you who will be glad to counsel with you as to your needs, make demonstrations, and explain a liberal financing plan. Or you can obtain descriptive literature on any Motiograph product without obligation by addressing your request to Motiograph, Inc., 4431 West Lake Street, Chicago 24, Illinois.

"Craftsmen to the Theatre Since 1896"

PROJECTORS

THEATRE-TV

CONTINUOUS-DUTY MOTOR—GENERATORS

IN-CAR SPEAKERS

SOUND SYSTEMS

MOTIOGRAPH

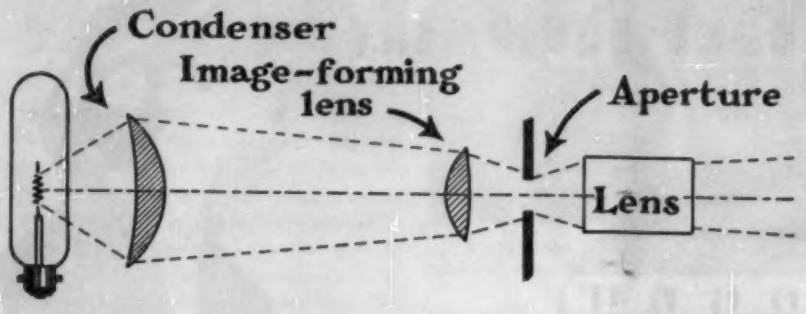


FIG. 5. The Koehler "intermediate-image" condenser system for incandescent portable projectors. The condensing lens, not the bulb filament, is imaged upon the aperture, hence uniform light.

and rugged electrical components which resemble those used in the American Motiograph - Mirrophonic amplifiers.

Ikovox speaker combinations, consisting of low-frequency dynamic PM speakers and cellular high-frequency horns in baffle cabinets, are quite like those put out in America.

The two latest Zeiss Ikon reflector arc-lamps are the Ikosol II for normal (low-intensity) carbons up to 35 amperes and for Beck (high-intensity) carbons up to 50 amperes, and the Magnasol IV for Beck carbons up to 80 amperes. These are illustrated in Fig. 4. Although these units resemble American simplified HI lamps in their general particulars, several significant differences require comment.

Instead of being placed at the extreme rear of the lamphouse, the mirror is positioned farther forward, as in the older American reflector lamps designed exclusively for LI operation. This position has always seemed desirable to the writer, for it permits better facilities for adjusting the mirror-aperture distance to obtain maximum uniform illumination on the screen.

Two Feed Motors

Although we do not find automatic "photronic" arc-positioning in these German lamps (a feature of several American rotating-positive lamps) the Ikosol II merits attention by having two separate feed motors, one for the positive carbon and one for the negative. This arrangement (of which we do not entirely approve) eliminates the need for differential gears and cams which, however, are found in the Magnasol IV. Because these lamps (especially the Ikosol II) may be used for LI as well as HI projection, the ratio of negative- to positive-carbon rates of feeding can be varied throughout an enormous range.

The controls of the Magnasol IV are neatly arranged on a panel beneath the door on the operating side, eliminating an array of knobs on the rear of the housing and permitting the projectionist to operate the projector without rising from his seat by its side.

The door of the lamphouse carries the crater screen as well as a dark-glass window, and is opened by sliding it up into the lamphouse. So also with the Ikosol II. The housing of both lamps is double-walled and well ventilated.

The Ikosol II, designed primarily for use with the amazing "Wabenkondensor" (Honeycomb Condenser) to permit even and uniformly white screen illumination with even the very lowest HI arc currents, and without much attention to the evenness with which the positive crater forms, has very few knobs. The mirror adjustments, moreover, are inside the lamp, and may be reached by raising the door slightly. We should not like this feature if we were operating the lamp without the Wabenkondensor, but with this special optical system the mirror adjustments need not be altered once they are set for maximum light.

Lamps Are Lighter

The first models of the Ikosol (not the present model) have been criticized by European projectionists for flimsy construction, and while it is true that German lamps are lighter and perhaps less substantially built than many American lamps, a high degree of ruggedness and mechanical stability is claimed for the Ikosol II.

While limitations of space prevent a discussion of the caboose-shaped predecessors of these modern German lamps (Magnasol I, II, and III, Ernesol, Kinesol, Artisol, and Ikosol I), attention is called to the influence which American lamp design has exerted upon the kerosene-drum shape of the lamp housing and upon such details as the carbon-consumption scales, arc-indicator screen, spatter-guard douser, and plain glass mirror shield (which, however, covers only the bottom portion of the mirror).

The mirrors employed in these lamps — 300 mm. (11⅞ in.) diameter for the Ikosol II and 356 mm. (14 in.) diameter for the Magnasol IV — are aspheric reflectors made of Ignal glass and notched out at the top (like the old Peerless LI reflectors) to prevent

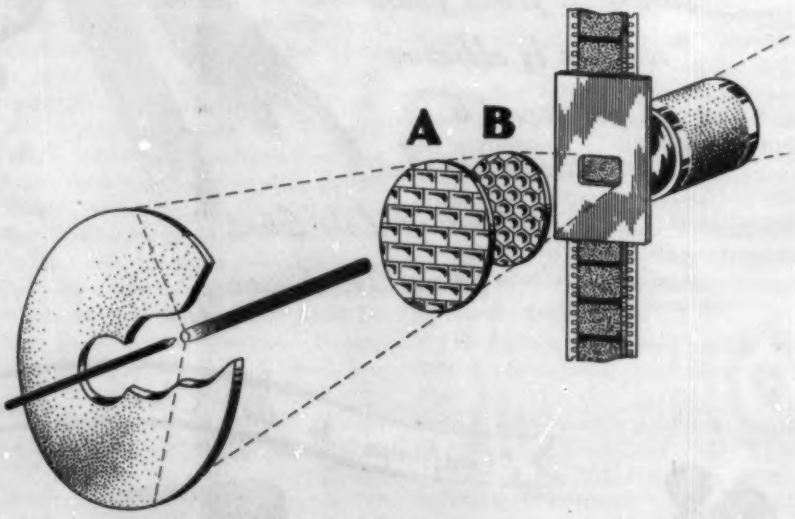


FIG. 6. The Wabenkondensor, or honeycomb condenser, a special modification of the Koehler principle for use with HI mirror arcs. The mirror is imaged by each rectangular lens of plate A upon each corresponding hexagonal lens of plate B. The lenses of plate B, in turn, superimpose the images of the rectangular lenses of plate A upon the aperture to give uniform brightness.

cracking due to the heat of the arc. When used in conjunction with the Wabenkondensor the side-to-center distribution of these lamps is 88% - 90%.

The theory of the Wabenkondensor was discussed in our translation and commentary beginning on page 5 of the April 1951 issue of IP. Now that the Wabenkondensor has undergone further development and has enjoyed wide and successful use in the field, a review of this ingenious optical system is again in order.

The Wabenkondensor

In principle, the Wabenkondensor is a special application of the Koehler intermediate-lens system used in German portable projectors to provide perfectly smooth screen illumination with incandescent lamps. Fig. 5 illustrates the Koehler system.

When an ordinary condensing lens is used, a more or less fuzzy image of the bulb filament is focused upon the projector aperture, and the field of illumination on the screen is accordingly marred by traces of the filament image. The Koehler system eliminates these inequalities of light by intercepting the beam with a second lens which forms an image of the evenly illuminated condenser upon the aperture.

Now, the center of the positive crater of a high-intensity arc is considerably brighter than the edges, the brightness-difference increasing with decreasing current. For example, the brightness of the edges of the crater is but 65% that of the middle at 50 amps., and only 45% at 25 amps., the lowest practical current for HI arcs. When this type of luminous crater is imaged upon the projector aperture, as by a conventional arc-lamp, we get a field illumination on the screen which is bright in the center and dim at the edges.

Secret Is "Honeycomb"

This disadvantage of HI projection could be overcome by the Kohler arrangement, imaging the uniformly illuminated mirror upon the projector aperture by means of a lens placed in the light-cone of the lamphouse. But, unfortunately, the hole in the center of the mirror, as well as the interposed positive-carbon holder, would cast shadows upon the aperture, making the light even more uneven. To make the Koehler principle applicable to the mirror arc, therefore, a new kind of lens had to be devised — the "Honeycomb" (*Waben*) condenser.

Fig. 6 is a diagram of the Wabenkondensor setup. The ordinary image-forming lens of Fig. 5 is replaced by two "lens-array plates" (*Linsenrasterplatten*) which consist of a large number (about 150) of single lenses which join each other without any gap (Fig. 7). The number and arrangement of these lenses is the same on both plates, but their sizes and shapes are different. Each single lens of the lenticular plate A in Fig. 6 focuses an image of the mirror upon its corresponding lens in plate B. The lenses of plate B are hexagonal to conform to the circular form of the mirror image.

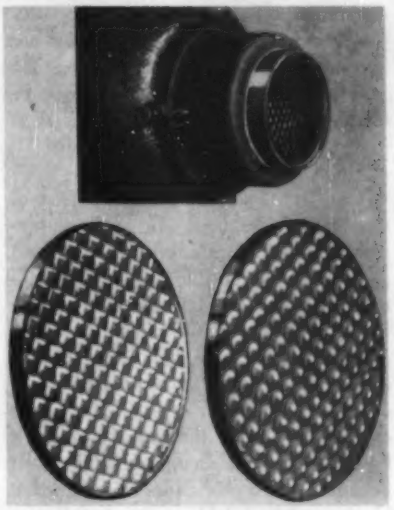


FIG. 7. The Wabenkondensor assembly in place in an arc-lamp. Pictured below it are the two lens-array plates: (left) the rectangular-lens plate, (right) the hexagonal-lens plate.

Each individual lens of plate B, in turn, images its corresponding lens in plate A upon the projector aperture. Accordingly, the lenses of plate A have an oblong shape of the 3:4 proportion to conform to the shape of the aperture. The total optical effect is the superposition on the aperture of about 150 different images of the oblong lenses. The partial shadowing of a portion of plate A by the positive carbon-holder can have no effect on the illumination of the aperture, which is completely even.

The Critical Distance

The distance between the mirror and the Wabenkondensor is not particularly important, but the correct, and very critical, distance separating the two lenticular reseau plates is maintained by their mount, which replaces the light-cone of the lamp. The distance between the projector aperture and the outer, smooth surface of the hexagonal-lens plate must be adjusted to 136 mm. (5.354 in.), with a permissible leeway of 1 mm. (0.039 in.). Under no circumstances should this distance be altered, for any change shows up on the screen as a loss of light or shadows at the edge of the picture.

It may seem that a little light might be lost by reflection from the surfaces of the two lenticular reseau plates, which is true; but these losses are minimized by the use of high-grade glass and antireflex coatings. But whatever the residual losses, they are more than compensated for by the efficient oblong shape of the spot of light on the aperture plate. A circular spot, as every projectionist knows, not only wastes a great deal of light, but heats the film gate (if not water-cooled) to an uncomfortably high temperature.

It has long been this writer's opinion that uniform screen illumination of the order of 90% - 95% side-to-center distribution is a necessity for first-class projection, and that the projectionist is severely handicapped in the practice of his art by the ordinary HI arc-lamp. There are several ways to produce uniform HI screen illumination, and the Wabenkondensor system is one of the more practical methods.

Efficient Illumination

What of the illumination efficiency of the Wabenkondensor? Does it increase the brightness of the picture or does it waste light? These questions can be answered on the basis of tests made with the Ikosol II lamp burning various HI trims with and without the Wabenkondensor.

In making these comparative tests the projector was run without film, a F/1.9 coated lens was used, the plate glass in the projection port was coated, and the lamp was adjusted for 75% - 80% side-to-center distribution of screen light without the antireflex-coated Wabenkondensor, 88% - 90% with it.

With a 6/5-mm trim burning 35 amps. screen light with the Wabenkondensor is 114% of the light without it. With a 6/5-mm trim at 40 amps. the light is 110%; with a 6½/5½-mm trim at 40 amps. 113%; with a 6½/5½-mm trim at 45 amps. 109%; with a 7/6-mm trim at 45 amps. 115%; and with a 7/6-mm

(Continued on page 28)

Color Is Catalyst in Battle of the Tubes

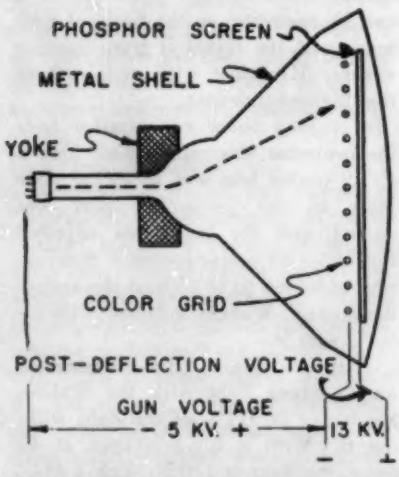
24-inch color television tube is already here. So claim the engineers who developed the unpublicized Chromatron. RCA and CBS vie in race for public favor as new medium gets FCC blessing

By FREDERICK HODGSON

COLOR TELEVISION has arrived officially — and with it comes the start of one of the most exciting races for preferred position since land-hungry settlers in the Old West careened across the plains in the sprint for the Cherokee Strip. The fun began on December 17 when word was flashed from Washington that the Federal Communications Commission had formally approved colorcasting under standards proposed by the National Television System Committee, an all industry group now well known by its initials, NTSC.

The new colorcast standards, replacing a previous set approved back in 1950 at the behest of the Columbia Broadcasting System with its now outlawed (except for closed circuit colorcasts) field-sequential system, permits reception of color programs on standard black-and-white sets.

In this article we are concerned principally with the "Battle of the Tubes," with the receiving end of color television rather than with the now satisfactorily settled issue of how to put the show on the air. This latter matter, of great importance to projectionists because of the increasing use of film both for broadcast and for rear projection in live shows, will be dealt with briefly later on in this piece and will be the subject of future IP attention.



This is a cross section of the Lawrence, single-gun Chromatron tube. Note how the electron stream inside the shell is deflected by the coil magnetic yoke. Note, too, the placing of the wires of the color grid in relation to the phosphor face plate. The 13 KV post deflection voltage varies.

The NTSC standards, now a part of the law of the land via FCC regulations, demand that any color television system be compatible, in other words that the 27,000,000 black-and-white sets now in use should not be rendered obsolete. The three types of tubes to be discussed here can receive in either black-and-white or color, a simple clockwise turn of the chroma dial on the receiving set changing a program broadcast in color from the familiar blacks, whites and grays to all the hues of the rainbow.

Three picture cathode tubes, or kinescopes, are major entries in the color television sweepstakes. They are RCA's tri-dot, three-gun kinescope, the one-gun Lawrence tube, also known as the Chromatron, and the three-gun CBS-Hytron, or Colortron. Engineers of the three developing companies quite naturally claim very special advantages for their respective brain children.

Let's look at this trio of entries in the contest of the cathodes, starting with a brief description of the RCA receiving tube. This kinescope was discussed in some detail by James Morris in an article on "Color TV . . . and How it Works!" in IP for September, 1953.

Basically the Same

Basically, the three kinescopes are the same. The differences, however, are of extreme importance because they will determine the winner, if any, in the race for public favor — and because the differences will largely determine how much you'll pay for a color TV set and how big a picture you will see.

Each of the tubes is of the vacuum type employing one or more cathodes, or "guns," to fire one or more electron

Dr. Paul K. Weimer, RCA engineer, is shown holding an experimental single tube unit for the taking camera in the RCA tri-color television broadcasting system. Called an iconoscope, or orthicon, the tube is expected to do the work of the three tubes now used. The CBS system uses a single tube for broadcasting color, separating the three colors by means of a color wheel. Circuitry for the single tube is simpler than for three guns, according to both CBS and RCA engineers.

beams at a phosphor plate. In the black-and-white phosphor plates the electrons, hitting the phosphor dots at high speed, cause these dots to glow with varying brilliancy. Hence you are able to see a picture. In color television the chemical composition of the dots has been changed so that they glow in color, also with varying brilliancy. In the case of the Lawrence tube, or Chromatron, there are no dots, phosphor strips are used instead of the dots.

Mask versue Grid

The electron beams, or cathode rays, carry the color and picture information and, in accordance with NTSC demands, utilize black-and-white scanning standards, 520 lines at 30 cycles per second. Two of the kinescopes, the RCA tube and the CBS-Hytron, use aperature masks, each perforation positioned directly behind a phosphor dot. Electrons stream through the tiny holes of the plate, strike the proper dots and so produce the color picture. The Lawrence tube, using but one gun, actually bends the beams by means of an electrostatic "lens," a charged wire grid placed just back of the phosphor face plate. This "lens" system eliminates the perforated shadow mask.

The Lawrence tube differs from the RCA and CBS-Hytron in other ways as well. For example, the distance from the cathode to the phosphor plate

is much shorter thus permiting a much larger picture. First of these new tubes, now completely unknown to the general public, to go on the market will be as big as those now popular in black-and-white sets, 21 inches and 24 inches. The top picture size so far announced for the RCA tube is 16 inches, with the 12½ inch tube being widely publicized. A 21-inch tube has been announced by CBS.

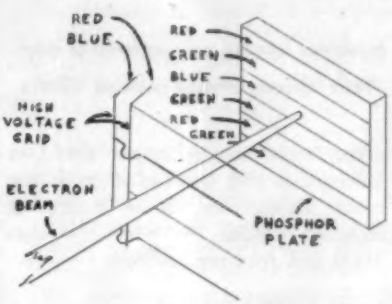
In the RCA tube the three guns are positioned inside a metal cylinder and converge at a narrow angle so as to aim three narrow electron streams at the perforated masking plate. The beams sweep across the plate, electrons streaming through the tiny holes to strike the phosphor dots and make each glow in its proper color. The magnetic deflection system in the tube, as in the other tubes under consideration here, is somewhat similar to that used in the black-and-white tubes.

An idea of the complexity of a cathode color tube may be gleaned from the fact that for the RCA 12½-inch picture size, the phosphor plate contains some 600,000 phosphor dots, 1,000,000 for the 16-inch. These are placed so closely together that the resultant picture is smooth. An analogy might be the photographs reproduced in IP as halftone engravings using a 120 screen. Examine one of these pictures under a magnifying glass and you'll see a myriad of tiny dots. Because IP is printed on an exceptionally fine grade of paper these dots can be smaller and closer together than is possible for a daily paper printed on newsprint. Newspapers usually use a screen as coarse as 60-line, or even 55-line. Use the glass to examine a photo in your favorite daily and you'll see what we mean. Another analogy might be the grain in film.

Midget Pictures

Some criticism has been leveled at RCA tubes, notably by Lee DeForest, and others, who say that the necessary metal shield adds unduly to the weight and also restricts picture size. RCA engineers, on the other hand, insist that there actually is no restriction on the ultimate picture size. However, the proof is in the eating, and any color TV we've seen on RCA sets has been of the midget variety, even in situations where the company was putting its best foot forward and would be expected to use the biggest screen possible and still have a good color picture. Too, RCA is known to be experimenting with one-gun tubes, even with the wire grid type of electrostatic lens as in the Lawrence tube.

In IP's humble opinion, subject to change as the inventive genius of



Above is a simplified sketch showing the passage of the high-velocity electron stream from the cathode of the Lawrence tube to the phosphor plate through the high-voltage grid, or electrostatic lens. Note that the two sets of grid wires (marked red and blue) are connected to two separate electrodes. In practice the grid is set but a fraction of an inch behind the phosphor plate.

engineers continues to perform electronic miracles, the most promising of the three tubes under discussion, for mass production and other reasons, is the Chromatron, or Lawrence tube. The public has been conditioned to big TV screens and may be expected to balk when asked to shell out anywhere from $500 to $1,000 or more for a TV set, color or not, with a picture size reminiscent of the early days of black-and-white.

The Chromatron was invented by a world-famous physicist, Dr. Ernest O. Lawrence, winner of the Nobel Prize for his invention of the cyclotron and other types of atom smashers. He is now director of the Radiation Laboratory at the University of California and consultant to Chromatic Television Laboratories, Inc. Dr. Lawrence was one of the top ranking scientists called upon for work on the atomic bomb. He is responsible for the development of the Calutron, the electromagnetic method for isotrope separation.

3-D on TV

The Chromatron, based on Dr. Lawrence's ideas, was brought to its present development by Chromatic Laboratories, a Paramount Pictures subsidiary headed by Richard Hodgson (no relation to the writer), a Stanford University engineer and wartime radar expert. We first saw the new tube at Chromatic's closely-guarded New York laboratory on the ninth floor of the Paramount Building. There we examined the electrostatic lens grid assembly and phosphor plate, heart of the tube. We mentioned to Albert Chesnes, a Chromatic engineer, that the assembly, with its grid of many hundreds of fine wires mounted just behind the phosphor screen, looked for all the world as if the lab were developing a motion picture screen for parallax barrier 3-D. Chesnes grinned, and let a secret slip. Just for the heck of it, Chromatic engineers had "broadcast" 3-D over the closed laboratory circuit. This, however, had nothing to do with the wire grid. Any color tube, RCA, CBS or Lawrence, can pick up perfectly good stereoscopic pictures of the anaglyph variety. Viewers, of course, must wear traditional red-and-green anaglyph glasses.

Later, still over the closed circuit, Chromatic engineers, for the benefit of IP and Henry Kogel, staff engineer for SMPTE, "broadcast" an analyph still picture. As in theatre 3-D projection using the anaglyph system, the original color picture reached the eyes through the "glasses" as a black-and-white picture. Without the red-and-green viewers the picture was nothing but a dark blur with red streaks.

3-D Importance

This completely unexpected blessing, or curse if one doesn't happen to like the third dimension in movies and shudders at the idea of its invasion of the home, is of real interest and may be of great importance. With 3-D projection of training films in industry and for military training purposes, rapidly gaining in use, along with in-plant television, the possibilities for development are obviously very great.

Up to this writing telecasting of 3-D has been impossible except under harrowing conditions. Several months ago we saw true 3-D on our home black-and-white television set in a broadcast from the University of Pennsylvania. The viewer stood with his back to the screen and watched the screen in a mirror held at arm's length. A piece of cardboard was then held vertically on a level with the nose, permitting the eye to get just one of twin pictures on the screen. We saw 3-D alright but wouldn't want to spend an evening with such dubious entertainment.

[TO BE CONTINUED]

The 3-D SCORE FOR '54

By THOMAS L. BURNSIDE

In or out of sync, the third-dimension business booms as single-strip and twin-film proponents view the New Year through rose-colored filters

WHAT with "Kiss Me Kate," "Hondo" and other 3-D features burning up boxoffice records all the way from the smog-ridden shores of California to the rocky coast of Maine, the backers of the third-dimension are happily looking forward to the sham and shekels of fifty-four.

Let's take a quick look at the 3-D picture before the stereophony horn-tooting and elbow-bending of New Year's Eve is forgotten.

To begin with, some sort of single-film system seems to be in the cards, despite the askance glances of some chief projectionists who are not too fond of the beam-splitting apparatus now being diligently peddled by a half a dozen companies.

Meanwhile, it's gleefully claimed that, as of January 1, some 5,000 theatres in the nation have been equipped for 3-D.

The Battle of Systems

Here's a quick run-down on the various single-strip 3-D systems in the nation as the film industry's most cock-eyed year got the hook from the wings:

VECTOGRAPH: This is a really promising single film idea, now being hatched by the Polaroid Corp., Cambridge, Mass. The picture-carrying emulsion is on both sides of the film base, therefore but one projector is needed. No projection filters are required because each side of the film is polarized oppositely. Viewers, however, are specific. Vectograph has just signed a royalty agreement with Technicolor. Watch this one!

MOROPTICON: This is the Matthew Fox tie-in beam-splitter system and was described in the December IP.

NORD: Like Moropticon, this is also a beam-splitter although the Nord people don't like that term, claiming it lets through more light than other processes of the same ilk. However, the prism apparatus is larger than the Moropticon and, because of projection room architecture, it is sometimes mounted outside the ports. It uses filters and requires audience viewers.

More Light Claimed

NORLING: Claims three times more light than other systems. Uses a double lens assembly attached to any standard projector. John A. Norling, the inventor, says it's not a beam splitter. IP holds, however, that if the light comes from one strip of film a beam must be split somewhere.

PHOTORAMA: Claims that no audience viewers are necessary. The system involves the ingenious use of a screen mounted on a concave frame. Doc Faige, director of Norpat, is interested in this one.

SYNTHETIC VISION: This is a beam splitter. Company tells IP it is getting set to demonstrate for the trade quite soon in Dayton, Ohio.

STEREOCOLOR: This uses a dual lens arrangement in the projector and, at no increase in sprocket speed, shoots 48 images a second at the screen. Roy E. Schensted, developer of this one-strip color system, claims his process gives the necessary solidity to the picture on the screen. Stereocolor has been demonstrated in Davenport, Iowa, and, while IP hasn't seen it and therefore cannot vouch for its value, engineers who have seen it say the thing really works.

Television 3-D

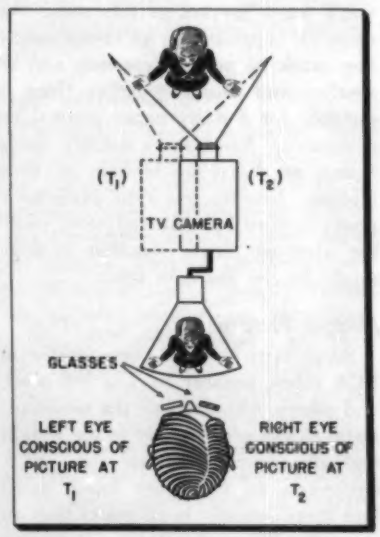
GENEOSCOPE: Primarily for television 3-D, this process is claimed by its sponsors to be applicable to theatres as well. In this system the viewer does all the work, wearing a pair of "shadow boxes" with lenses over each eye. One lens cuts down the speed of the light rays from the screen (that's what the man says!), the other letting the beam pass normally. The result is one image hitting the retina a split second before the other, thus giving the stereo effect.

DORSETT: This one, developed by Dorsett Laboratories for military use, is promised for some time in '54 but hasn't been released so far for mere civilians.

ASTOR: Uses a single film and a single lens on a special camera. Film speed in the taking camera is doubled and, so far as IP can find out right now, the printing process does the rest. Sponsors of the system, known as the "Astor 3-D Single-Camera Optical Unit," are R. M. Savini, president, and John C. Feys, vice-president, of Astor 3-D Films, Inc.

3-D SCREEN: Word from London has it that Boris Morros, who is demonstrating the Moropticon system in the British Isles, has got hold of a special multiple-screen system that will enable people to get the stereo effect without glasses. To IP, this sounds like another parallax barrier gimmick.

(Continued on page 27)



This is a sketch of the Geneoscope 3-D television system. The system, which the company says is adaptable for theatre use, requires viewers to wear "glasses," red over the left eye and yellow over the right. The red filter, according to the Geneoscope people, retards the chemical dilution of the red pigment of the eye's retina causing that eye to see the picture at T_1, a moment before the right eye sees T_2. Illustration is by courtesy of Tele-Tech.

What's Your Problem?

Projectionists whose problems appear below will each receive a $3.00 check from IP. We'd like to know "what's YOUR problem?"

Q. Perhaps you can help answer a small problem which should be of interest to other projectionists. Ashcraft lamps are well known the world over for their many fine features and here in New Zealand we have many of these lamps operating in numerous theatres. As you know, all good high intensity lamps have some means of projecting an image of the burning carbons onto a gauge card. Ashcraft lamps have an imager assembly but owing to the system used the projected image of the two carbons is upside down on the card. The projectionist is constantly looking at an arc in reverse. He has two carbon images to carry on the gauge card lines to be sure but it would be a great help to have the projected image the correct way up. The factory tells me that a small metal plate with a tiny hole drilled in it and placed an inch in front of the present lens will reverse the image. I've tried this and so far with no results. Perhaps you can tell me how the arc image can be reversed. Is it only possible by using two lenses? The present image magnification is okay, approximately twice actual size on the card. Douglas A. Harley, Chief Projectionist, Embassy Theatre, Auckland, New Zealand.

A. Reversal of the arc image is extremely simple, but for the life of us we can't see why you want to do that! The "picture" of the arc tail flame reaches the aperture in reverse, exactly the way you see it on your gauge card. Obviously you have an older Ashcraft lamp. These lamps had the gauge mounted near the top of the lamp house, with the lens and mirror assembly on a level with the arc. The newest lamps have the lens and mirror in the same place but the image-carrying beam is aimed forward and hits a small ground glass screen. The image is still inverted as it is on your gauge card. Apparently someone (Clarence Ashcraft swears he didn't do it!) suggested to you that you place a small pin-hole camera in front of your assembly. Yes, it should work. However, Mr. Ashcraft and your IP reporter ran a test at the Long Island City factory and successfully reversed the image by inserting a small (1" diameter) long focal length lens in front of the mirror. We held the lens about two inches from the mirror. The tail flame, right side up, was focussed perfectly on the ground glass screen. You can do the same thing with your gauge card, using a cheap lens from the corner optician and using your ingenuity to mount it in permanent position.

Anyway, as we see New Zealand from the antipodes in New York everything is upside down there. Or maybe, from the New Zealand point of view, we're standing on our heads in New York.

* * *

Q. Will you please advise me of the correct name and trade term for the F/1.9 projection mirrors that are used with F/1.9 projection lenses? The supply dealers in our territory have told the managers that there are no such mirrors. I will appreciate any information that you can give me on this. John Marks, Sec., Local 636, Lewistown, Penna.

A. The supply dealers your managers have been talking to must have rocks in their heads. Just to make sure that these mirrors are obtainable through dealers, IP did some checking in the New York area and they're buyable from any one of them.

However, you do not tell us what type lamp you use — and these fast reflectors cannot be used with most lamps because the mirrors are made only in 16" diameters and above. For example, the Strong "Mighly 90," and several other lamps can take a big mirror, the dimensions of the housing being big enough. If you have been using slower speed lenses and have now switched to the F/1.9, or even F/1.8, and are having trouble because of your 14" mirrors, things can usually be corrected by changing the operating distances within the lamphouse, the positioning of the arc in relation to the mirror and the lens, as an example. Your service engineer should know about this. Or you might write to the manufacturer of your lamps. Give him all details, including throw, screen width, etc. We can't help you very much from here because we lack the essential information about the situation, or situations, involved.

* * *

Q. I have been taking IP for only a short time, so maybe you have discussed this problem in earlier issues although I haven't heard about it. While I realize you cannot give me a solution for my problem, I am in hope that you could satisfy my curiosity by giving me a reason for it. I work for an organization which exhibits second- and third-run features. In many cases I will find almost the last 14 feet of a reel completely covered with all sizes, shapes and descriptions of cue marks. Why is it necessary for each projectionist to put on his own personal cues? Aren't the original ones sufficient? Dennis Lewis, 10337 Dante Ave., Oakland, Calif.

A. According to Mike Springer, chief projectionist at RCA's Johnny Victor Theatre in New York, projectionists should be happy to go by the Academy standard cue markings that are placed on all prints sent out by the studios to the exchanges and from there to the projection room. When, for some reason, extra cue marks must be made, they should be done neatly with a grease pencil or special marking device. Cue marks which scar or scratch the print are not only unnecessary but most unfair to those who must use the print afterwards.

Unfortunately there is a persistent feeling among some projectionists that their own specially-designed cue marks give a greater sense of security during changeover. These projectionists are said to feel that they are putting their signature on the film when they make their own cue marks, and they don't get the same feeling of security from marks made by somebody else. It is also true that a projectionist, faced with an already badly marked-up print, often has no choice but to add extra cue marks to avoid confusion. In addition, the standard cue marks may sometimes be very dim or even missing. IP is planning an article on this subject in the near future.

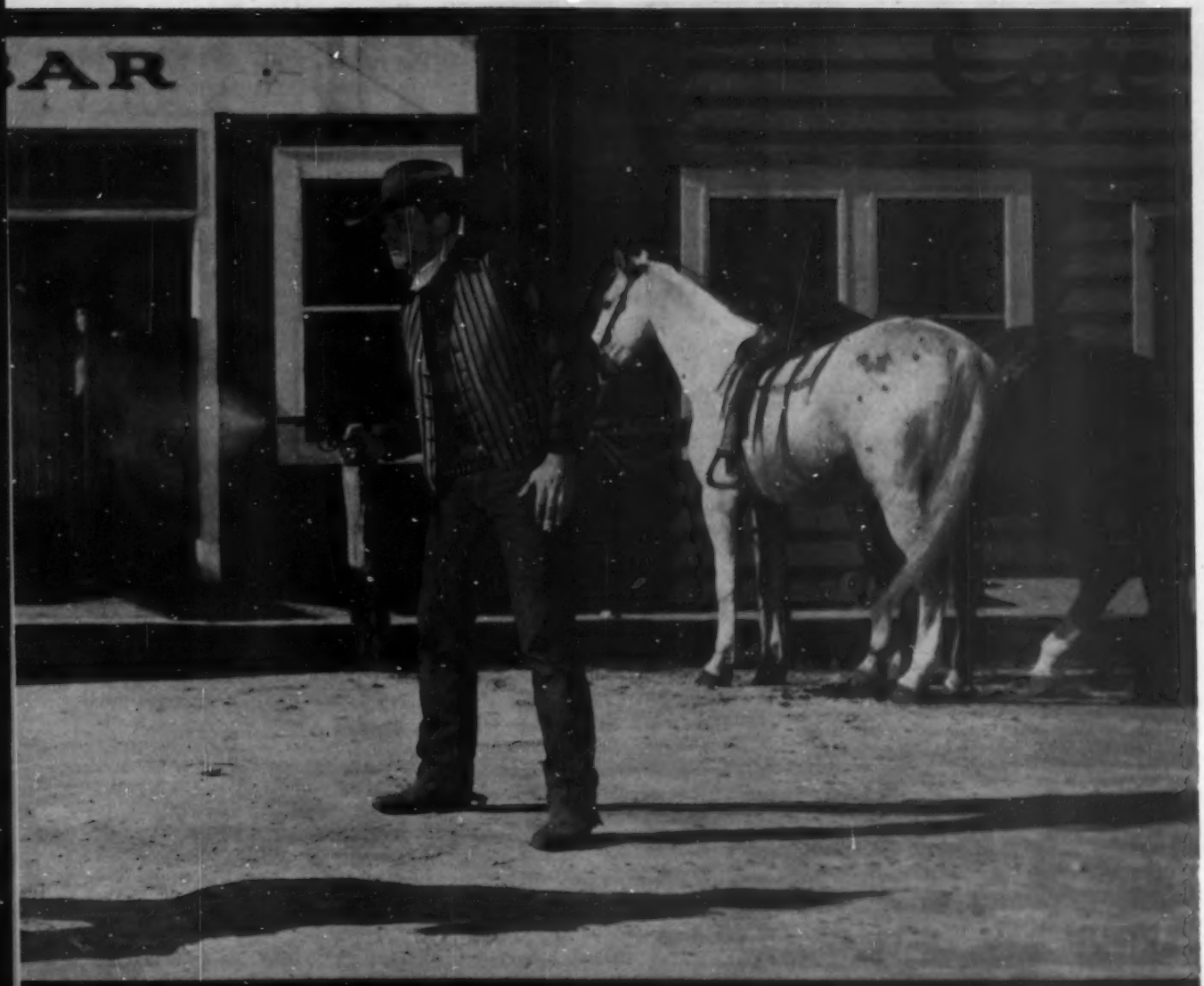
PERSONAL NOTES

DR. ALFRED N. GOLDSMITH, a co-founder of the 42-year-old Institute of Radio Engineers, will receive the coveted Founders Award of the IRE at the Institute's annual banquet in March at the Hotel Waldorf-Astoria in New York. The award is given only on rare occasions to outstanding leaders in the radio engineering profession. Dr. Goldsmith, a past president of the SMPTE, received the IRE Medal of Honor in 1941.

R. WILLIAM DASSOW has been appointed sales manager for the the theatre and television screen division of Radiant Mfg. Corp., Chicago, makers of the Astrolite screen. Mr. Dassow was formerly sales manager of C. Bendsen Marquee Co., and later part owner of several outdoor theatres. He was also associated with National Theatre Supply for 18 years, eight of which were with the New York branch and ten years as manager of the Chicago branch.

Old style shooting...

new style showing



"Law and lawless meet on the street and shoot it out." Time-honored script . . . new style, wide-angle handling—giant figures, cause-and-effect in action, sense of depth—all in one. Made for today's projection—sound and picture—on today's wider screens. Technical problems, there are . . . problems of film selection, processing and projection . . . problems which Kodak is helping the industry solve through the facilities of the Eastman Technical Service for Motion Picture Film.

Branches are located at strategic centers, inquiries invited.

Address: *Motion Picture Film Department*, EASTMAN KODAK COMPANY, Rochester 4, N. Y.

East Coast Division
342 Madison Avenue
New York 17, N. Y.

Midwest Division
137 North Wabash Avenue
Chicago 2, Illinois

West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, California

IN THE
SPOTLIGHT

THE BUREAU of National Affairs, a non-partisan research service, recently announced that paid vacations are now practically universal. The Bureau analyzed 400 current labor-management contracts, covering all fields, and found that paid vacations are provided in 98 percent of union contracts, compared with 90 percent in 1950. The most prevalent vacation formula calls for one week after one year's employment; two weeks after five years' service, and three weeks after 15 years. Vacation as an earned right for workers has become an accepted fact in unionized industries.

• Frank Kinsora, president of Detroit Local 199 for the past 20 years, has taken over the duties of ailing Roger Kennedy, the Local's business representative. Kennedy has been in failing health for the past few years, but was able to take care of his official duties until recently when his illness took a serious turn.

• The wage committee for Local 324, Albany, N. Y., recently concluded negotiations for a new contract providing members of the Local with $4 weekly wage increases, retroactive to September 1, 1953. A special feature of the new pact calls for an additional $7.75 per week when 3-D features are shown. IA Representative Joseph Basson assisted the Union officials in the negotiations.

• AFL unions have contributed $90,000 to the Truman Memorial Library at Grandview, Mo. It is estimated that the library will cost $1,750,000. AFL President George Meany is one of the trustees of the Harry S. Truman Library, Inc.

• Herbert Aller, business representative for Cameramen's Local 659, Hollywood, Calif., recently charged that documentary films are being produced for the U. S. State Department and the U. S. Armed Forces by non-union civilians, who have been given motion picture contracts by these government agencies. "Using non-union civilians to make pictures in this country for the State Department and Armed Forces is comparable to using prison labor to escape paying union labor scales," he stated. Aller promised to launch an investigation to find out if the purpose of this policy is to "undermine unions." He is arranging an early meeting with IA President Walsh for the purpose of further exploring the situation and taking necessary measures to counteract this policy.

We wish to extend our thanks to our many friends throughout the Alliance who so graciously remembered us with their beautiful cards during the Holiday Season.

• A report in the exhibitor trade press relative to the decision handed down by the American Arbitration Board in the controversy between Los Angeles Local 150 and the Southside Theatres and the Fanchon & Marco circuit anent 3-D showings was so slanted as to appear in favor of the exhibitors. The following explanation, forwarded to this department by Charles Vencill, secretary-treasurer of the Local, puts a slightly different light on the ruling, to wit:

"Our contract provides for arbitration on conditions within the contract," states Vencill. "Southside Theatres and Fanchon & Marco tried to arbitrate something that was not in the contract, charging violation of certain clauses which in no way pertained to 3-D because there was nothing in the contract that mentioned 3-D.

"The Local held that the contract covered only flat pictures because at the time of the negotiations, 3-D was unknown and not discussed. Southside Theatres and Fanchon & Marco wanted to substitute arbitration for negotiations. The Local held that 3-D was not arbitrative under the terms of the contract. The Arbitration Board on a 2 to 1 decision upheld the Local's contention that the contract calling for one projectionist applied only to flat pictures and that 3-D showings were subject to further negotiations."

• Local 400, Alexandria, La., reached an agreement with the management of the Joy Twin Drive-In and the Joy Drive-In theatres in which the projectionists were given a 7½ percent weekly wage increase, effective January 2, 1954. Representing the Local at the negotiations were W. Martin Lip-

LOCAL 306 MEMBERS BRING HOLIDAY CHEER TO HOSPITAL PATIENTS

Members of the Movie Social Club of Kings County, which is comprised of members of New York 306, at the Hospital of St. Giles the Cripple in Brooklyn, N. Y., on Christmas day where they distributed gifts and brought entertainment to the crippled children. Harry Garfman (center), the Brooklyn and Queens business representative for Local 306, devotes much of his spare time to help bring a little sunshine into the lives of these unfortunate shut-ins. Club members assisting Garfman, as shown above are, left to right: Burt Sutter, Murray Berlof, Harry Weinberg, and Irving Meltzer.

scomb, business representative; Stewart E. Wilson, secretary, with IA Representative Albert S. Johnstone, assisting in the discussions.

• AFL and CIO leaders signed a "no-raiding" two-year agreement, in Washington, D. C., effective January first. Although the pact is binding only on the parent organizations, leaders of both AFL and CIO predict that the individual Locals will soon fall in line and sign similar agreements.

• An amendment requiring only one man in the projection room instead of the two-man law in effect for the past 20 years, was recently introduced before the St. Louis board of alderman. This bill is sponsored by a group of exhibitors who have long tried to reduce the projection room manpower and are determined to make the measure effective before existing contracts with St. Louis Local 143 expire, August 31 next. Needless to say, Local 143 officials are equally determined to defeat the bill.

• Evidently remembering the smart showmanship of Local 400 in spotlighting the Christmas parade of the previous year, the Alexandria (La.) Chamber of Commerce once again turned to the Local for assistance in staging the holiday parade last month. The Local's job was to highlight the Santa Claus float — a feature attraction of the parade. A Strong Trouper spotlight with a 50-60 foot throw, was bolted to the floor of a trailer that immediately preceded the Santa float so as to provide a steady light. Nine different color combinations playing on the float achieved a kaleidoscopic effect, producing a striking spectacle.

The Local received a rental fee for the use of the spotlight, and three men working the parade — Jerry Clark, Ralph Scott, and Earl Dupree — were well paid for their services. W. Martin Lipscomb, the Local's business representative, was in charge of all arrangements.

25 Years Ago—January 1929

• The IA General Executive Board donated $2,000 to the Gompers' Memorial Fund . . . Warnings were issued against a party who used the name of Lance and represented himself to be a member of Local 185, Spokane, Wash. On the strength of this false representation and forged documents, he borrowed money from the Local at Columbus, Ohio, and left the city before he could be apprehended by the police, presumably "working" his way East . . . This seemed to be open season for imposters — John Downs, claiming membership in Baltimore Local 181, appeared at several Southern Locals for the purpose of obtaining loans. The Baltimore Local denied Downs' claim of membership . . . Minutes of the Geneneral Executive Board meeting, held at the Hotel Roosevelt, New Orleans, La., November 19, 1928, were published in the IA Bulletin for January, 1929. Among the cases heard and acted upon by the Board were the following:

Request of Local 348, Vancouver, B. C. to transfer back to the First from the Twelfth District. Unanimously approved . . . Request of Local 289, Elmira, N. Y. to transfer from the Tenth to the Fourth District was denied . . . Appeal of Fred F. Heck, Local 157, Allentown, Penna., against action of the Local in expelling him from membership for violation of Local laws was denied . . . Local 376, Syracuse, N. Y. appealed for the reinstatement of member Robert Sardino, who had been expelled on complaint of Syracuse Local 9 for violation of International By-Law. Appeal was sustained and reinstatement approved . . . Eugene Klingensmith, Local 132, Niles-Warren, Ohio, appealed $10 fine for breaking Local laws. Denied.

Turn Your Projection Skills Into Cash!

Many things, from busted toasters, irons and radio sets, need fixing and offer ways to earn spare time pin-money.

By MICHAEL SMOLLIN

Member, Local 640, Nassau and Suffolk Counties, N. Y.

THE SPECIALIZED skill of the projectionist opens several avenues to sideline income. Many projectionists, including myself, earn extra money, sometimes in considerable amounts, by exploiting their skills outside the theatre. Following are some suggestions for those who like to employ their free time in profitable activities.

Careful analysis of sideline activities open to projectionists reveals three basic requirements:

(1) Your skill — this includes at least an elementary knowledge of electricity including Ohm's Law, the ability to use a multimeter, soldering iron, electric drill, tape and reamers. Also very important is your ability to find needed information quickly. This is your mental equipment.

(2) The second requirement comprises your stock of tools, some of which you probably already own and others, as previously mentioned, you can add as business warrants. You will need a "base of operations" — a room in which to keep your equipment and a work table.

(3) The third is a practical and regular method of going after business.

Let us take these requirements in order and examine them. Many of us learned our abc's of electricity by bits and snatches from various technical books and articles. Some of us, like myself, were fortunate enough to have to our credit a formal course in elementary electronics. A knowledge of Ohm's Law is very important. It is assumed that every projectionist knows this law in its algebraic form so that he can quickly and accurately determine, when necessary, the dissipation requirements.

Every projectionist should be able to use a basic test meter so that he can measure resistance, AC and DC voltages, current consumption, and make continuity checks. Perhaps my own best investment was the $20 I paid for a multimeter. If you can use a meter to tests for leaks and grounds in your lamphouse, you can make money outside the theatre.

The foregoing will take on their full importance when, for instance, the lady next door brings you her electric iron which refuses to work (and this is exactly how many of us started on the path to extra income). You check the plate marking on the iron, attach the meter prods across the plug prongs, set the selector for the proper range, and you will be able to see the

nature of the trouble. If the iron is rated for 1000 watts, your pencil and paper will give you the answer quickly, using Ohm's Law.

Repairing electric toasters, and table lamps offer another source of sideline income.

Record Players

You probably own a record player and you know from your own experience that sooner or later it will need attention. The manual type is very simple; the changer type is complex, particularly the three-speed variety. You should obtain servicing instructions for the changer in question and study them. The illustrations that are included with the instructions will enable you to grasp the sequence of operations and will give you a better understanding of the mechanism.

Your skill also includes the knowledge of circuits as used in your own theatre amplifiers. Many portable record changers with their own sound systems require frequent attention because the heat is contained within the cases. This heat destroys the lubricating qualities of grease and oil, turning them into sticky, gummy layers and interfering with the automatic operation of the machine. This is a very lucrative source of side-income, but you must know your stuff and give quick and efficient service.

The skill of the projectionist in handling film and projectors stands him in good stead in the 16- and 8-mm fields. The narrow gauge films are widely used now, especially in the educational and industrial fields, and a most satisfactory income may be delivered from the repair of these machines.

Sound Projectors

In addition to portable sound projectors, the tape recorder is also becoming very popular in non-professional application. Both types of equipment are operated quite often by relatively unskilled persons and are bound to require attention by an experienced person sooner or later. Many projectionists own their own 16-mm equipment and profit by renting it out, with themselves handling the shows.

In checking portable projection systems, your procedure is much the same as with standard machines in the projection room except that some special stunts may be necessary. When testing for sound, for example, use a piece of thin paper to interrupt the x-lite beam. This is so that you can see the light, if it is present. This would not be possible with a thick card and your conclusions might be incorrect. With the volume control advanced, power on, you should get a plunk in the speaker when the x-lite beam is intercepted. Placing your finger on the grid cap of the first stage tube in the amplifier will result in a buzz in the speaker, if the amplifier is OK.

Portable sound movie systems are very tough and can take a lot of abuse. An extra PEC and x-lite are usually carried with each set-up. Exciter lamp failure is often due to a defective oscillator coil. Here your ohmmeter tells the story quickly — whether it is an open, short, or ground. If you are in a position to do this sort of work, you should obtain schematics for several makes and study them.

The thing that owners appreciate is resourcefulness in making the equipment operate by substitutes. Thus an x-lite in a portable movie system can be supplied with current from batteries appropriately wired to give the required pressure and paired off to give heavy current. In a pinch you can use a 50L6 output transformer as a step-down transformer to light the x-lite, but here will you run into a noticeable hum since a PEC has a high sensitivity to frequency change.

Radio Repairs

Radio repair work requires somewhat extensive equipment in the way of oscillators, tube testers, and analyzers. Custom sound installing does not require any great number of tools and the projectionist usually has the background needed for this work. Such work involves selecting an amplifier, a record player, and a speaker. Where a stereophonic or binaural effect is desired, a speaker system is necessary. Home decorating magazines provide good ideas on custom installations that can be "sold" to prospective customers.

Part of your equipment is your "caddy." This is a baggage type case with compartments in which you carry tubes, phono cartridges, a clean rag, extension cords, and other tools. A test meter, soldering iron, and socket wrenches are indispensable tools.

(Continued on page 26)

Best Wishes for a Happy and Prosperous 1954

to all our Friends from

PROJECTIONISTS LOCAL NO. 128

Boston, Mass.

MAYBE THE UNITED NATIONS CAN SETTLE THIS THING?

By Louis Sumien, member of Local 640, Nassau & Suffolk Counties, N. Y.

Free Polaroid Land Camera

- The Picture-a-minute Camera -

for the best letters on

3-D

projection

If you're a working projectionist, if you know any 3-D tricks, if your ideas can improve stereoscopic projection, then you stand a good chance to win one of these camera beauties as offered by the Polaroid Corp. in cooperation with your magazine

THE Polaroid people think that America's much berated projectionists should be heard from on the third dimension. IP thinks so too!

So for three months, starting with the March *International Projectionist*, the Polaroid Corporation, in cooperation with IP, is giving one Polaroid Land Camera per month — *and for free* — to the working projectionist who writes the best and most constructive letter to the 3-D Editor.

Subject: 3-D movies and how to handle them.

Letters will be judged by a three-man panel consisting of Dr. Lewis Chubb, research physicist, Polaroid Corp.; Henry Kogel, staff engineer of the Society of Motion Picture and Television Engineers, and Frederick Hodgson, editor of IP.

What we want is simply this:

Your suggestions on how to make 3-D better. Any tricks you may have devised in your own projection room, tricks that improve your 3-D projection. For example, one theatre we know has an ordinary carpenter's spirit level handy so that the 3-D filters at the ports may be kept absolutely horizontal. If you've had a brain wave like that, send it in!

If you've found a way to out-smart the exchanges and their sometimes amazing inspection systems, let's hear about it!

In other words, if you, as a working projectionist, have an idea or a suggestion you think is good don't hesitate. Don't walk, run to the nearest mailbox.

You don't have to be a Hemingway. We don't care how the letters are written. It's the subject matter that counts.

Address your letters to the 3-D Editor, *International Projectionist*, 19 West 44th St., New York 36, N. Y.

Write as many letters as you like. And if you don't win the first camera, try again and you may win the second — or the third.

Incidentally, the Polaroid Land Camera is a honey. It's that famous new camera you've been reading about, the one that develops its own pictures in just one minute. The price, if you had to buy it, is a neat $89.75 (and worth every nickel of it!).

The Polaroid Land Camera gives you photography at its quickest, easiest and simplest. One adjustment takes care of all shutter and lens settings. All you do is snap the shutter, pull a paper tab and, voila, in one minute by the clock you have your picture. Prints are black and white and are big 3¼" by 4¼" — and they can be enlarged or duplicated, too, if you like.

So get you're letters in — fast! To qualify for March's camera your letter must be in the IP office no later than February 15th.

Here's wishing you luck!

Good projection is the key to good 3-D

More Small Houses Go Stereophonic

IF DOUBTERS there be as to the practicability of stereophonic sound equipment in small theatres they might ponder an installation now being made by National Theatre Supply. Walter Green, company president, tells of the installation in the pint-size screening room of a state censor board.

The tiny theatre seats 85 and the biggest screen the room can take measures 7 by 13 feet.

With the battle dust now settling as 20th Century-Fox and various recalcitrant exhibitor groups observe an uneasy truce, IP is receiving an increasing number of reports on installation of stereosound and CinemaScope equipment in the smaller theatres of the nation.

Family Size Theatres

National Theatre Supply, for example, announces more than 600 installations in family-size theatres, the neighborhood and small town houses that are the backbone of the picture business. Use of such equipment, of course, is now commonplace for the big movie palaces, the Music Halls, the Roxys and the other "Grand Central Station" theatres.

Motiograph sends along a list of 185 small theatres in which that company has completed the equipment job.

"And this list is for our company only," said Fred Matthews, of Motiograph, "and does not include Altec Service Corporation, RCA, Century, Simplex, Ballantyne, Ampex or any other company. These companies, as well as ourselves, are making installations or filling orders on stereophonic sound."

Pointing out that the most important elements of the CinemaScope process are a wide screen, plus true stereophonic sound, Mr. Matthews said that "these elements combine to provide the greatest approach to motion picture story telling ever achieved and the public has spoken for them by attending the theatres which are showing pictures filmed in this medium. The alert theatre owner who wishes to share in the receipts of the many great pictures to be produced for wide screen and stereophonic sound will make an early decision to properly equip his theatre."

Disclosing that his company has booked almost 700 orders in the past five months, Walter Green, of National Theatre Supply, said that a rapidly increasing proportion of these sales are to theatres in the 500 to 1000 seats bracket, with many in even smaller categories.

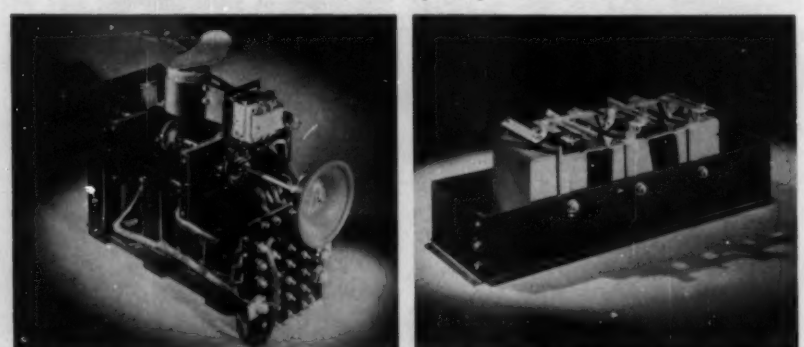
Tests Exhaustive

As to the 85-seat screen room for the state censor board, Mr. Green said his company had made exhaustive tests to determine the feasability of stereophonic sound in such a small theatre.

"The results were as effective and spectacular in this small auditorium as in the largest theatre," he said.

RCA installations are proceeding so rapidly that the company is sending equipment by truck from Camden, N. J., as far away as Michigan and Rhode Island. In one recent month, according to A. J. Platt, manager of RCA Theatre Equipment Sales, more than 100 independent theatres and five circuits, including the RKO and Stanley-Warner chains, placed orders with the company for stereo sound. Ampex, as reported elsewhere in this issue of IP, made 45 installations in the New York area alone in less than one month.

Strong Electric Has New Heavy-Duty Selenium Rectifiers



Above are two views of the components of the new selenium rectifier produced by the Strong Electric Corp., Toledo, Ohio. Described as extremely rugged and dependable, the rectifier is designed for use with high intensity projection carbon arc lamps pulling from 70 to 135 amperes. Two sets of transformer taps are provided for adjusting output current over a wide range of amperages and to compensate for variations in line voltages from 200 to 250. At left is shown the fan, switch and transformer and at right is the grid system.

IA ELECTIONS

LOCAL 150, LOS ANGELES, CALIF.

Wallace G. Crowley, *pres.*; Chas A. Vencill, *sec.-treas.*; Clyde W. Shuey, *bus. rep.*; E. R. "Sam" Pierson, *guide*; C. C. Bolinger, Virgil Crowell, John Sickinger, *exam. board*; Charles Bramel, R. L. MacDonald, Tom Ginthner, *trustees*; Al Adams, Harold Angel, Clem Marchand, George O'Brien, H. C. Smith, *exec. board*; A. Adams, W. G. Crowley, C. W. Shuey, Paul J. Mahoney, Magnus Nielsen, Geo. J. Schaffer and C. A. Vencill, *del. to IA Convention.*

The following were elected to the *board of directors* of the Local 150 Club, Inc.: A. Adams, H. Clay Blanchett, W. Crowley, M. Nielsen, G. Schaffer, C. Shuey, Leo F. Stockwell, C. Vencill, Harold Angel, R. L. MacDonald, P. Mahoney, and H. C. Smith.

LOCAL 173, TORONTO, ONT., CANADA

J. Sturgess, *pres.*; A. Kerrin, *vice-pres.*; L. Lodge, *sec.-treas.*; R. Higgins, *rec.-sec.*; P. Travers, *bus. rep.* (by acclamation); D. Siegel, R. O'Connor, L. Applebaum, R. Wilson, *exec. board*; T. Covert, J. Harris, E. Whyatt, *trustees*; S. Cohen, *sgt.-at-arms* (by acclamation); G. Robinson, *tyler* (by acclamation); P. Travers, J. Sturgess, G. Jones, and D. Siegel, *del. to IA convention.*

LOCAL 181, BALTIMORE, MD.

L. Sieber, *pres.*; H. Braswell, *1st vice-pres.*; C. Dotson, *2nd vice-pres.*; W. MacKinzie, *3rd vice-pres.*; T. P. Finn, Sr., *sec.-treas.*; C. Towers, *rec.-sec.*; C. Bayne, *bus. rep.*; H. Gentile, C. Grauling (chairman), R. Rushworth, *trustees*; E. Kastner, *sgt.-at-arms*; E. Eich, O. Niquet, *wage scale comm.*; C. Grauling, S. Isaacson, L. Sieber, *del. Baltimore Federation of Labor.*

LOCAL 253, ROCHESTER, N. Y.

Louis Levin, *pres.*; Joseph Pandina, *vice-pres.*; Lester D. Barager, *sec.*; Leon E. Burton, *treas.*; Fred E. Boekhout, *bus. rep.*; John Copple, *sgt.-at-arms*; Harry Levy, *trustee*; Frank Britt, Louis Goler, Floyd Spencer, Ernest Henley, *exec. board*; Joseph Vecchio, Sr., and Abe Orden, *del. Central Trades.*

LOCAL 348, VANCOUVER, B. C. CANADA

Douglas Calladine, *pres.*; W. McCarthey, *vice-pres.*; George Thrift, *sec.*; Ray Wardrop, *rec.-sec.*; Les Walker, *bus. rep.*; Gordon Sutherland, *sgt.-at-arms*; L. Walker, F. Smith, and D. Calladine, *del. IA Convention.*

OBITUARIES

FELIX D. SNOW, 66 , 3rd vice-president of the IA and business representative for Stage Employees Local, 31, Kansas City, Mo., died on Christmas day following a heart attack suffered the previous day. The day before he was stricken he was re-elected by acclamation as business representative of his Local, having held that post for the past 28 years. He served as a member of the General Executive Board since 1940 and up until the time of his death was the IA representative for the Midwest, spending a great deal of his time traveling.

Funeral services were held at the Freeman Chapel, Kansas City, on December 29. President Walsh and other top IA officials served as honorary pallbearers.

H. MERRILL YOUNG, 58, former secretary of Local 661, Reading, Penna., died recently after a six-months' illness. He began his projection career back in 1915 when he joined the Reading Local. Last summer he was appointed chief projectionist at Reading's Warner Theatre but illness forced him to give up the position shortly afterward.

Young was active in American Legion affairs, and was commander of Gregg Post, 1943-44. He was a member of Masonic Lodge 2, Reading Consistory; Rajah Temple, Tall Cedars of Lebanon, and Green Dragons. He is survived by his wife and daughter.

J. SIDNEY CRANS, business representative for Local 311, Middletown, N. Y., died several months ago at the age of 70. He joined Local 45, Newburgh, N. Y. in early 1900, transferring to Local 311 in 1923. In 1924 he was elected business representative of the Middletown Local, and served in this office until the time of his death.

ROBERT ANSETT, SR., 62, member of New York Stage Employees Local No. 1 died last month. He was a member of the Local for more than 40 years, and served as president for 10 years, from 1938 to 1948. At the time of his death he was a property man at the Roxy Theatre in New York, having held that position for the past 21 years.

JOHN FORD, member of San Francisco Local 162 since 1912, succumbed to a heart attack on December 28. At the time of his death he was employed at the El Capitan Theatre, where he worked for a number of years. He was an ardent IA man and was very popular in the Local. His sudden death was a shock to his many friends throughout the Alliance.

(The late John Ford is not to be confused with John A. Forde, present business represenative of the Local.)

Huff Announces New Nozzle

An improved nozzle for Huff Hydro Carbon Coolers is announced by the Hal I. Huff Mfg. Co., Los Angeles. The new nozzle is fitted with a high-refractory ceramic insert designed to increase its life. The ceramic insert acts as an insulator, minimizing the danger of arcing. All previous models of the Huff cooler can use the new nozzle.

more B.A.*

*(BOXOFFICE APPEAL)

MOVIES ARE BETTER THAN EVER

with SUPER SNAPLITE projection lenses

● GREATER LIGHT ● GREATER CONTRAST ● GREATER SHARPNESS

Watch your "B. A." climb when you install Super Snaplite Lenses. Give your patrons the benefit of pictures at their best. You can't beat the Super Snaplite f/1.9 when it comes to putting a clear, sharp picture on your screen.

Super Snaplites give you a true speed of f/1.9 in every focal length up to 7 inches. Ask for Bulletin 212.

"You Get More Light with Super Snaplite"

KOLLMORGEN Optical CORPORATION

Plant: Northampton, Massachusetts

New York Office: 30 Church St., New York 7, N. Y.

PROJECTION SKILLS

(Continued from page 22)

These you should own anyway. You may add other items as your business warrants, always using money earned on the side. Reference material is also important.

A word of caution about your stock — stick to profitable, often-called -for parts. Do not overstock. Find a source where parts may be obtained quickly.

Go After Business

Once set up and organized for some specialized work, your next move is to canvass your neighborhood. Stop at stores dealing in appliances and get acquainted with the owners. Leave your cards with people. In a small town you can carry a small ad in the local newspaper. Remember the value of advertising is cummulative; each time the reader sees your name, you become more strongly entrenched in his mind.

Last, but equally important, you should collect your money upon completion of the work. Where custom installation is involved, it is customary to collect about 60% of the figured cost as advance payment. This is necessary because components cut or drilled to special requirements cannot be returned for exchange.

The avenues to pin-money listed above are just a few of the possibilities open to the projectionist with time on his hands and the need (as who hasn't!) for some extra cash.

Film Pioneer Dies

George K. Spoor, 81, well known film industry pioneer, died in Chicago on Nov. 24. The original Essanay Co. got its name from "S" for Spoor, and "A" from his partner, Gilbert M. "Broncho Billy" Anderson.

Born in Highland Park, Ill., and educated in Waukegan, Spoor entered the picture business in 1895 when he invested in a device called the Magniscope, a precurser of the motion picture machine. Essanay is credited with showing the first commercial 3-D films in the United States. That was in 1925.

The old Essanay studios in Chicago, together with Selig in the same city, gave many top stars their start, including Charlie Chaplin, Wallace Beery, Gloria Swanson and Francis X. Bushman. The studios closed in 1916 when the film industry center moved to Hollywood.

McAuley Lamp Booklets Ready

New booklets covering operating instructions and maintenance of the Peerless Magnarc and Peerless Hy-Candescent Cinearc lamp are now available from the J. E. McAuley Mfg. Co., 552-554 West Adams St., Chicago 6, Ill.

Heavily illustrated, the booklets cover such subjects as: setting up, voltage and amperage, electrical connections, lamphouse ventilation, carbon trim alarm, optical alignment, wiring diagrams, carbon holder sizes, and mechanism shutter alterations.

New Adjustable Lens

An anamorphic projection lens, said to be adjustable for five different aspect ratios, has been demonstrated in Hollywood by RKO Pictures. The lens, tentatively priced at a low $200, was designed by Joe Tushinsky, a studio technician.

The ratio, according to RKO claims, starts at 1 and can be moved up to 3 to 1, just about covering the field. RKO announces a companion "printing" lens capable of processing film into any ratio desired.

The trick lenses were produced by Tushinsky, formerly an independent producer, in collaboration with his brother, Irving. RKO backed the project and provided studio space for tests.

THE NEW RAYTONE SCREEN will change your mind about the screen you're going to buy!

30 years of "SCREENMANSHIP" pays off!

We have once again met the Challenge of a new medium and stand ready to supply the theatres of the world with a screen that the Exhibitor wants for his theatre.

Raytone is equal in MEASURE to any screen on the market today! Weigh all factors — and RAYTONE'S NEW HI-LUX SCREEN will emerge as the Exhibitor's choice!

1. **BETTER Light Intensity** for wide screen, 3-D and Anamorphic use.
2. Clearness of image, seamless construction
3. No streaks, blemishes or visible shadings
4. Tear-proof. Guaranteed flame-proof.

HI-LUX Screens now available for any CinemaScope production. Now in use for CinemaScope in all sizes both large and small — will comply with all requirements for proper presentation. Accepted and preferred by leading Circuits and Independent Exhibitors!

RAYTONE SCREEN CORP. 165 CLERMONT AVE. BROOKLYN 5, N. Y.

THE 3-D SCORE FOR '54

(Continued from page 16)

We've had these before and they haven't worked.

MGM's NORMAL VISION: Dore Schary, production chief at MGM studios, has made the intriguing announcement that his company is experimenting with "normal vision," a process to "take up where 3-D left off." Based on "physiological principles", according to Schary, the system will require viewers to wear a new type of Polaroid glasses.

Research Council System

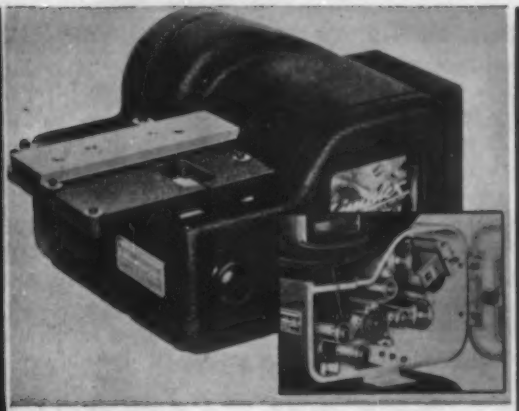
However, perhaps the happiest news comes from Hollywood where the Motion Picture Research Council, determined to bring some sort of sense into the chaotic scramble, is working on a single-film system of its own. The unit, somewhat larger than either the Nord or the compact Moropticon, has already been tested and reports are favorable.

William Kelley, secretary of the Council, sends along the information that the new single-strip system is currently being set up in the Academy Award Theatre in Hollywood. The film, says Kelley, is compatible with Nord's but not with Moropticon.

"We do not use a beam splitter," Kelley writes, "but separate the pictures after we are out approximately 8% to 10% of the throw."

Meanwhile, proponents of 3-D, particularly the people who sell viewers (principally Polaroid and Pola-Lite) are going to town with some top-flight promotion. Pola-Lite is backing a 3-D Council, a sort of chamber of commerce affair designed to push stereo. Polaroid is sending engineers into the field to show projectionists, and others, just how to keep two-strip in sync. The same company is making equipment available free to theatres. IP plans a story on this in the near future.

However, and quoting our contemporary, *Variety*, the situation in the single-trip 3-D sweepstakes is a "chicken or the egg" matter. Theatres are willing to sign up with Moropticon, Nord or whoever comes down the pike provided the producers will promise to make the films. Conversely, the producers are telling the exhibitors to install the equipment first. The question before the house seems to be: If the chicken does cross the road will she lay an egg?



Simplex

MAGNETIC SOUNDHEAD

to be sure!

The soundhead chosen by exhibitors throughout the country for first runs of the new stereophonic sound features!

★ "Brush" pick-up head plugs in for instant replacement.

★ Tight loop system tested and approved by major studios.

★ Compact, easy to install, fits any standard projector.

★ Proven Performance!

NATIONAL THEATRE SUPPLY

Division of National • Simplex • Bludworth, Inc.

PROJECTION IN EUROPE

(Continued from page 13)

trim at 50 amps. 109% when the Wabenkondensor is used.

In addition to providing screen illumination which is uniform in brightness and color, therefore, the Wabenkondensor actually increases the brightness of the picture!

Helps In Small Theatres

The very small theatres which are so numerous in Europe find in the Wabenkondensor a perfect solution to their lighting problems. Beck (HI) arcs consuming less than 35 amps. are not ordinarily feasible because of their extreme "hot-spot" characteristics and discolored light. Now, the Wabenkondensor permits the use of Beck arcs drawing as little as 25 amperes because it insures screen light which is perfectly uniform both in brightness and color. This is one of the "selling points" of the Wabenkondensor, though the writer must admit that he is not able to vizualize a theatre screen so diminutive as to be excessively bright with a 35- or 40-amp. Beck arc. It is always a good thing to have plenty of light to spare; and when there really is far too much light, a contrast-enhancing gray screen may be used.

The Wabenkondensor is intended for HI lamps only, and may be used with arcs of any power up to 50 or 60 amps. before the danger of cracking the lens-array plates becomes really great. The projectionist who is lucky enough to have the Wabenkondensor as a component of his lamp equipment can forget his mirror and carbon adjustments — almost. The light remains unform in brightness and color even when the crater burns at quite a slant, though it is hardly necessary to add that for the brightest light it is still necessary to maintain a crater formation sufficiently good to prevent the glowing gas ball from streaming off in the tail-flame of the arc. But most startling of all is the fact that the amount, uniformity, and color of the screen illumination with the Wabenkondensor remains practically constant when the arc is moved to and from the mirror through a considerable range.

In addition to the regular Ernemann Model X projector, there is a

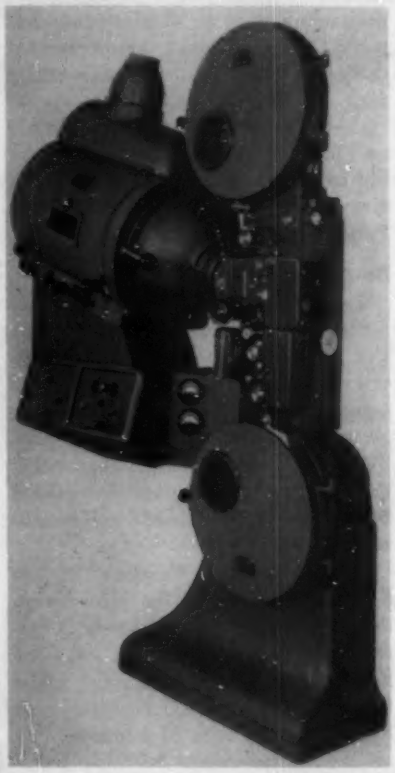
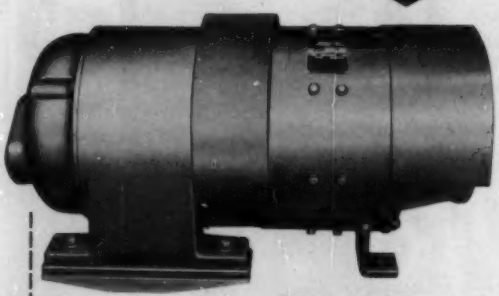


FIG. 8. The Ernemann X modified for undistorted projection at a 22° tilt. This projector was first built to order for the Eidgenossische Technische Hochschule, Zurich, Switzerland, where it is now giving satisfactory performance in the new physics lecture room.

Wide Screen Projection Requires More Light... Get an "HS" TransVerteR

REG. U.S. PAT. OFF.

The "HSD" dual-ballast rheostat available in two capacities — 65-100 amperes and 5-31 volts; 85-115 amperes and 5-25 volts.



The "HS" Transverter 115/230 amperes

Control Panel Type G

to Meet THIS INCREASED POWER REQUIREMENT

• Exhibitors everywhere are finding out that wide screen equipment requires increased amperage for proper screen illumination.

Loss of light through use of filters plus giant screen sizes makes existing projection equipment inadequate to do the job.

Additional power is a must, for carbon-arc amperage and voltage requirements have been increased up to 100% for wide screen projection.

In order to get this increased power, get a Hertner "HS" Transverter.

When you buy a Transverter you are obtaining a power conversion unit that has been the standard of the industry for nearly half a century.

Distributed by National Theatre Supply
In Canada: General Theatre Supply Company

Hertner

THE HERTNER ELECTRIC COMPANY

12690 ELMWOOD AVENUE . . CLEVELAND 11, OHIO

A General Precision Equipment Corporation Subsidiary

MOTORS . MOTOR GENERATORS . GENERATOR SETS

specially designed Model X which has no counterpart in the projection apparatus produced by any other manufacturer. It is intended solely for undistorted projection at steep angles. This machine is shown in Fig. 8.

It is common knowledge, even among the uninitiated, that an excessively large projection angle results in a picture having an exaggerated vertical dimension and a distorted shape due to increased width of the picture toward the bottom of the screen — the so-called "keystone effect." The upper drawing in Fig. 9 illustrates the conditions which prevail when a conventional projector is pointed downward at the screen.

The keystone effect (which, by the way, is seldom visible from the projection room) is not troublesome if the tilt of the projectors does not exceed 10 or 15 degrees. A greater projection angle results in distortion that spoils the cinema patron's enjoyment of a motion picture. Tilting the screen backwards at the top is a common remedy, but it has the disadvantage of making the picture look "askew"

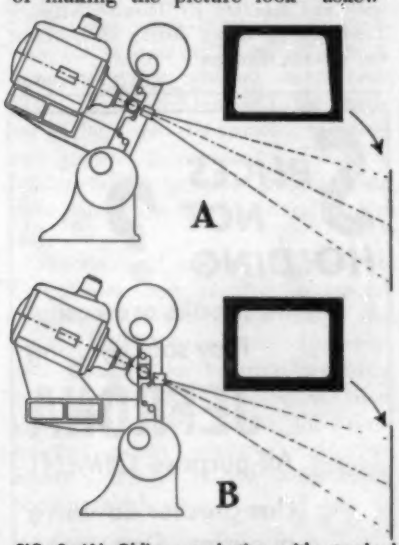


FIG. 9. (A) Oblique projection with standard projector results in distorted picture. (B) The Ernemann X modified projector makes possible oblique projection free from the "keystone effect." Note that the film gate is parallel to the screen, and that the optical axis of the lens is perpendicular in relation to the film-plane.

to patrons at the side of the auditorium.

The Zeiss Ikon works at Kiel attacked this problem on entirely new lines when the Confederate Technical College of Zurich, Switzerland, required for a certain auditorium an undistorted screen image at a projection angle of 22°. The first step taken by

NEW! f/1.8

Bausch & Lomb

B&L Super Cinephor Projection Lenses

First and only lens giving full edge-to-edge sharpness on widest screens!

Now . . . the *one* lens series that gives you today's brightest, sharpest image on any screen: CinemaScope, 2-D, expanded 2-D, and 3-D! Finest edge-to-edge definition ever achieved. White glass—no color absorption . . . transmits full image color and brightness. Fastest projection lens made. Complete range of focal lengths. You're all set *now* and throughout the foreseeable future with this revolutionary new *f*/1.8 series— new world's standard for the motion picture industry.

Exclusively Recommended for CINEMASCOPE

20th Century-Fox recommends the new B&L *f*/1.8 Super Cinephor projection lens with B&L anamorphic adapter *exclusively* for clearest, sharpest, finest CinemaScope screen images.

WRITE for complete information. Bausch & Lomb Optical Co., 61625 St. Paul St., Rochester 2, N. Y.

Scene from "THE ROBE," 20th Century-Fox CinemaScope Epic

Zeiss engineers was the development of a suitable lens — the Alinar II. The next step involved modification of the Ernemann X to conform to well-defined theoretical principles.

Keystone distortion is completely avoidable when the plane of the film remains parallel to the screen even when the machine is inclined, as shown in Fig. 9.

In such a case as this, the projection lens must be positioned so that its optical axis is perpendicular to the film-plane, but moved downward to a point specified by optical considerations. Only when these conditions have been met can the whole film-photograph be reproduced sharply.

Required New Lens

It can be seen at once that the image-forming light rays enter the lens obliquely, requiring the lens to reproduce a flat field over a very wide angle. Ordinary projection lenses are not suited to the job because they normally cover only the 10° to 15° necessary for the standard film picture; but at an inclination of 22° an angle of about 50° is required. So large an angle of view must not be achieved by decreasing the "speed" of the lens, forasmuch as it is not advisable to abandon the speed of F:2 which is nowadays the customary speed of 35 mm projection lenses. Because a rather long focal length has to be retained, this difficulty is the main reason why the problem of distortion-free oblique projection had not been solved previous to the creation of the Zeiss Ikon Alinar II lens.

As the Ernemann X has removable base plates for components on the operating side of the mechanism, all of the alterations required for oblique projection could be made in the upper base plate, the rest of the mechanism remaining unchanged. The position of neither the cylindrical shutter nor the film gate was changed, though the aperture-window and the lens were lowered to new positions in accordance with the projection angle. The lamphouse was placed upon an intermediate inclined support fastened to the regular lamp table.

As a result of the oblique passage of the light rays through the lens, the field of light projected upon the screen showed a fadeaway from top to bottom owing to the natural vignetting of the lens. This unevenness of screen illumination was completely overcome by a special arrangement of the Wabenkondensor optics.

Furthermore, the oblique transmission of the light within the lens necessitated an adjustment of the position of the film plane in conformity to the mounting of the lens, as the depth of focus of these lenses is extremely small.

The film gate, therefore, has been so arranged that it can be inclined within a very small range in order to place the running film into the most favorable focal plane.

Tests with the new projector met all demands and produced an undistorted, well-illuminated image on the screen with sharp definition over the entire image-field.

[THE END]

Closed Circuit TV

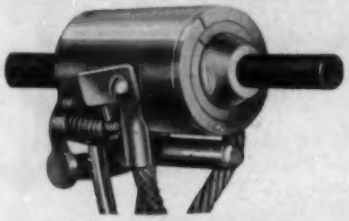
Closed circuit theatre television is being used this month by National Dairy Products to present its advertising and promotion plans at a series of sales meetings in a number of cities. The program, produced by Alexander Leftwich and handled by Theatre Network Television, is shown during off hours at the various theatres.

huff

THE ORIGINAL

Hydro Carbon Cooler

Concentrates all the heat at the gas ball.



Permits more amperage. You gain 20 to 40% more light from your present lamps. No copper coated carbons needed. Pays for itself from the savings on carbons, even with higher amperage.

See your Dealer or write to

HAL I. HUFF MFG. CO.
659 W. Jefferson Blvd.
Los Angeles 7, Calif.
— EXPORT DIVISION —
FRAZAR & HANSEN, LTD.
301 Clay Street San Francisco, Calif.

Vallen for
CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES
VALLEN, Inc.
AKRON 4, OHIO

SPLICES NOT HOLDING ?
Film breaks are costly.
Play safe by using
JEFRONA
All-purpose CEMENT
Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.
CAMERA EQUIPMENT CO.
1600 Broadway New York 19, N. Y.

LARGE-CORED Lorraine ORLUX SUPER-CHARGED Carbons
For CINEMASCOPE
3-D, Drive-Ins, and other Wide Area Screens
CARBONS, Inc. BOONTON, N. J.

BIG YEAR FOR COLOR

(Continued from page 8)

picking up the dye, the amount depending on the thickness of the gelatine.

Matrix Carries Color

As the process was carried out, clear gelatine-coated release stock was impressed against the matrix film in exact registration by rollers and by sprocket teeth that are the exact shape and size of the film perforations. The same procedure was followed with the other color to be printed, each dye being "imbibed" by the release print.

The Technicolor positive was ready for projection as it came from the printer. A large number of positives could be printed from a single set of matrices, and when these wore out, a new set could be made from the camera negative.

The basic improvement made in Technicolor after this period was to convert it from a two-color to a three-color process. This was accomplished shortly after the advent of sound when Dr. Kalmus again became dissatisfied with his process and decided that a two-color system was no longer adequate. He devoted himself to the building of improved Technicolor cameras and processing machinery. The first full-length Technicolor film to use three colors was "Becky Sharp" in the early 30's.

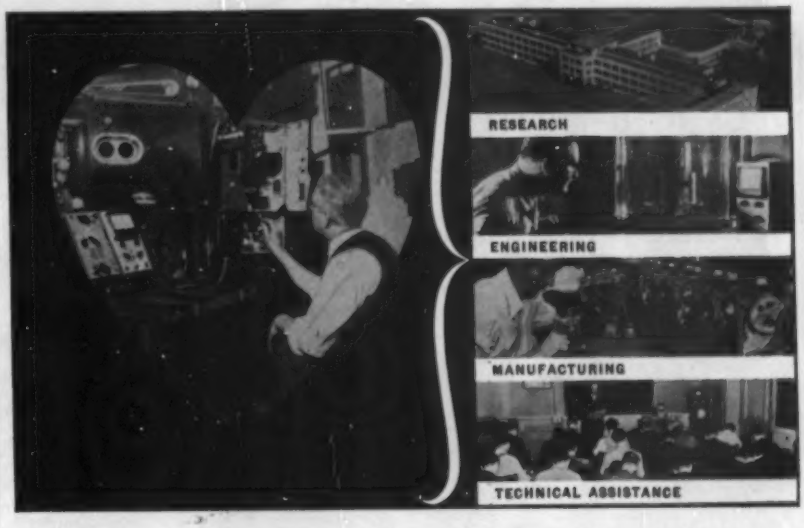
The standard method of filming in Technicolor now involves a special camera which also makes use of the beam-splitting principle. However, even though three separate negatives, one for each primary color, are used in the Technicolor camera, the beam-splitting prism produces only two identical images of the scene being photographed.

Prism Splits Beam

A prism of special design is positioned directly behind the lens. Part of the light passes straight through the prism and through an emeraude or greenish filter where the green color values are recorded on a film. The remainder of the light from the lens is reflected at a right angle to form an image of the scene in the second aperture. In this aperture, two negatives run together in a double pack. The first film in the pack records the indigo color values and the rear film records vermilion light through a continuous vermilion filter that runs between the two films in the pack.

A number of less drastic but important improvements have been made in the Technicolor process in recent years. One is the method of using the process for color film shot in a single-film standard motion picture camera with "monopack" color film. How this process records a scene in full natural color will be described along with the new Eastman Color process which also is a monopack process.

Eastman Color film, is fast gaining in popularity, both because of its



Finest Theatre Service—*Anywhere*

BACK of every RCA Theatre Service engineer are all the resources and facilities of the Radio Corporation of America. No technical problem in theatre sound or projection is too difficult for RCA Service engineers to tackle and solve . . . for YOU!

For over 25 years, RCA Theatre Service has been consistently of the highest quality . . . thoroughly dependable . . . and friendly.

RCA Service Company, Inc.

A Radio Corporation of America Subsidiary

Camden, N. J.

ONE? TWO? THREE?
Regardless of the new medium you select for your theatre, all "depth" pictures require near perfection from the projectors. Before converting see your dealer about using LaVezzi projector parts in an overhaul. The unusual precision and long life bring about efficiency, economy, and peace of mind.
LAVEZZI
MACHINE WORKS
4635 W. LAKE ST., CHICAGO 44, ILL.

WANTED:

Experienced Sound Engineers for Theatre Servicing.

For particulars write to

INTERNATIONAL PROJECTIONIST

Box 954

19 West 44 St., New York 36, N. Y.

adaptability to CinemaScope and because it can be handled by a great many processing laboratories in contrast to Technicolor prints which, up to the present, can be processed only by Technicolor laboratories in Hollywood and London. Technicolor, realizing its disadvantage on this score, has just entered into an agreement with the Deluxe Laboratories in New York for the processing of Technicolor prints on the East Coast. Another laboratory is planned for Paris.

The Eastman Color negative — consists essentially of three light-sensitive emulsions, each sensitized differently and coated on a safety support. Incorporated in the emulsion layers are dye couplers which react simultaneously during development to produce a separate negative dye image along with the silver image in each layer. The silver images are removed later by bleaching. Two of the dye couplers are themselves colored.

The original color of these couplers is discharged during development in proportion to the development of the emulsion. The remaining colored couplers serve as automatic color correcting masks to aid in obtaining good color reproduction when the color negative is printed on the companion product, Eastman Color print film or on other color materials.

The color print film is a multi-layer color film intended for use in making color release prints from the Eastman negative. It is also used in printing from black and white separation negatives such as the Technicolor process.

Three Emulsions

The Eastman Color print film consists of three light-sensitive emulsions, each sensitized differently and coated on a safety support. Incorporated in the emulsion layers are dye couplers which react simultaneously during development to produce separate dye images with the silver image in each layer.

The silver image is later removed by bleaching, leaving only the dye images in the picture area. The soundtrack area is redeveloped to give both a dye and silver image for the track. Since the material is exposed through a color negative (or from black and white separation negatives with colored light) the resulting images are color positives.

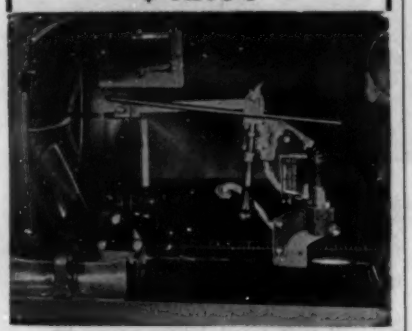
In conclusion it can be stated that color motion pictures have become more important than black-and-white in the Hollywood scheme of things. So far as competition between color processes such as Technicolor and Eastman Color is concerned, it is considered likely by such observers as Nick Tronolone that both will be important in the future.

It is likely, he said that Technicolor will be able to solve the problem of adapting the dye-imbibition process to CinemaScope. In addition, Eastman Color, which is constantly being improved and which can be processed in the studios' own laboratories, has the advantage of offering greater freedom and control over the production process.

TV Booms in Britain

More TV sets than radios are now being manufactured in Great Britain. During the first nine months of 1953, some 728,000 video sets were made compared with 706,000 radios.

Now You Can Install the
CRON-O-MATIC
Fully Automatic
CARBON SAVER
at the NEW LOW PRICE of only
$42.50



Saves $400 a year on carbons if you are using Ashcraft "D" or "E", Brenkert-Enarc, Peerless Magnarc or Strong Mogul lamps.

Burning average lengths (3¼") down to ¾" saves 2½" or 22.2% of carbon costs.

Uses positive carbon stubs of any length without preparation. When entirely consumed, the new carbon goes into use without losing the light, or otherwise affecting lamp operation.

If your dealer can't supply you, order direct.

DEALERS NOT PRESENTLY HANDLING THIS SENSATIONAL CARBON SAVER ARE INVITED TO INQUIRE ABOUT A DEALERSHIP

PAYNE PRODUCTS CO.
Cron-O-Matic Division
2454 W. Stadium Blvd. Ann Arbor, Mich.
( ) Send literature on the Cron-O-Matic
( ) Ship Cron-O-Matic Carbon Saver:
( ) C. O. D., including postage.
( ) Remittance herewith.
Name .....
Theatre .....
Street .....
City & State .....
EXPORT: Frazar & Hansen, Ltd.
San Francisco, New York, Los Angeles

ETHYLOID
FILM CEMENT

Makes a splice that HOLDS!

Actually, a splice made with Ethyloid is stronger than the film itself.

Works fast in any climate, hot or cold. Will not congeal.

* * *

THIS UNION MADE FILM CEMENT IS AVAILABLE AT

ALL THEATER SUPPLY DEALERS

FISHER MFG. CO.
1 SALTER PLACE • ROCHESTER 13, N. Y.

Clayton Ball-Bearing Even Tension Take-Ups
For all Projectors and Sound Equipments
ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

THE CLAYTON REWINDER
FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

Bell & Howell presents

the world's sharpest

CinemaScope lens

For CinemaScope and all wide screen releases.
Designed to fit all projection lenses.

sharp focus... *Six* elements provide extreme sharpness. Each individual lens precision collimated for crisp definition to full corners and edges.

resolution... modern formula developed by world's foremost lens designers... all twelve glass surfaces held to test gauge quality.

brilliance... unequalled light transmission... all air surfaces magnesium fluoride hard coated—3 doublets butyl methacrylate cemented.

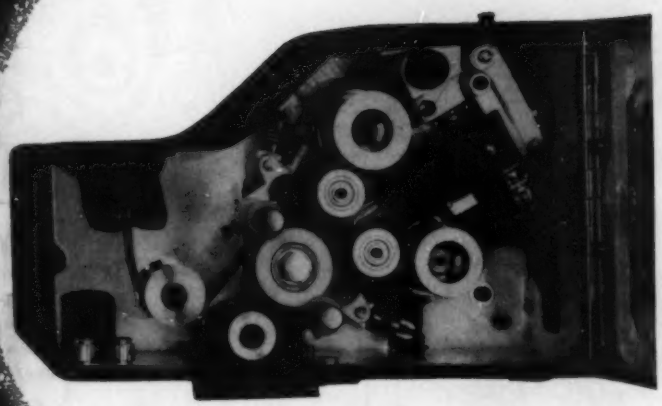
full color... color banding and fringing eliminated by full correction of *all* color aberrations.

For full information see your local theatre supply house.

Bell & Howell

7160 McCORMICK ROAD • CHICAGO 45, ILLINOIS

Every Exhibitor NEEDS
STEREOPHONIC SOUND!



Simplex
STEREOPHONIC SOUND